PB83-114280

Metallic Mineral Processing Plants Background Information for Proposed Standards. Volume 2: Appendices

(U.S.) Environmental Protection Agency
Research Triangle Park, NC

Aug 82

U.S. Department of Commerce
National Technical Information Service
NTIS

TECHNICAL REPORT DATA

(Please read Instructions on the reverse before completing)

1. REPORT NO. EPA-450/3-81-009a and -009b	2.	3. RECIPIENT'S ACCESSION NO. PB83-114280
4. TITLE AND SUBTITLE Metallic Mineral Processing Plants - Background Information for Proposed Standards		5. REPORT DATE August 1982
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Office of Air Quality Planning and Standards U.S. Environmental Protection Agency Research Triangle Park, North Carolina 27711		10. PROGRAM ELEMENT NO.
		11. CONTRACT/GRANT NO. 68-02-3063
12. SPONSORING AGENCY NAME AND ADDRESS DAA for Air Quality Planning and Standards Office of Air, Noise, and Radiation U.S. Environmental Protection Agency Research Triangle Park, North Carolina 27711		13. TYPE OF REPORT AND PERIOD COVERED
		14. SPONSORING AGENCY CODE EPA/200/04

15. SUPPLEMENTARY NOTES

16. ABSTRACT

Standards of performance for the control of particulate matter emissions from metallic mineral processing plants are being proposed under the authority of Section 111 of the Clean Air Act. These standards would apply to facilities at processing plants for which construction or modification began on or after the date of proposal of the regulation. This document contains background information and environmental and economic impact assessments of the regulatory alternatives considered in developing proposed standards.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Air pollution Pollution control Standards of performance Metallic mineral processing plants Particulate matter	Air pollution control	13B

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

18. DISTRIBUTION STATEMENT Unlimited	19. SECURITY CLASS *(This Report)* Unclassified	21. NO. OF PAGES 822
	20. SECURITY CLASS *(This page)* Unclassified	22. PRICE

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE

PB83-114280

EPA-450/3-81-009b

Metallic Mineral Processing Plants - Background Information for Proposed Standards

Volume 2: Appendices

Emission Standards and Engineering Division

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air, Noise and Radiation
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

August 1982

i

APPENDIX A. CREATION OF THE BACKGROUND INFORMATION DOCUMENT

In August 1979, the U.S. Environmental Protection Agency promulgated a list of 63 major source categories and ranked them in order of priority for NSPS development (44 FR 49222). The method used to rank the source categories was preceded by the Administrator's determination that these sources contribute significantly to air pollution that may reasonably be anticipated to endanger public health or welfare. Following this determination, source category rankings were based on the quantity of emissions from each source category and the mobility and competitive nature of each stationary source category. The metallic mineral processing industry was ranked 14th in priority on a list of source categories selected by EPA.

Based upon the results of a screening study conducted during May to October 1978, work on the Background Information Document (BID) was initiated for the metallic mineral category.

In June 1978, a literature survey was begun and the industry was canvassed by phone to obtain information on plant operations and to determine which plants, if any, appeared to be well controlled. Plant visits were then scheduled to obtain information on process details, quantities of emissions, and emission control equipment. The feasibility of emission testing was also determined during the plant visits. The significant events relating to this effort are discussed in the chronology below.

A.1 CHRONOLOGY

The chronology beginning on the next page lists the important events which have occurred in the development of background information for a New Source Performance Standard for the Metallic Mineral Processing Industry.

Date	Activity
June 13, 1978	Literature survey initiated for screening study.
June 23, 1978	First contact with the American Mining Congress.
July 6, 1978	Telephone survey of metallic mineral processing plants initiated.
August 8, 1978	Plant visit to NL Industries, Inc., MacIntyre Development, New York.
August 14-15, 1978	Plant visit to St. Joe Lead Company, Brushy Creek, Fletcher, and Viburnum Operations, Missouri.
August 15, 1978	Plant visit to Cominco American, Inc., Magmont Mine, Missouri.
August 17, 1978	Plant visit to Climax Molybdenum Co., Henderson Operations, Colorado.
August 18, 1978	Plant visit to Climax Molybdenum Co., Climax Operations, Colorado.
August 21, 1978	Plant visit to Aluminum Company of America, Arkansas Operations, Arkansas.
August 22, 1978	Plant visit to Reynolds Metals Co., Sherwin Alumina Plant, Texas.
August 23, 1979	Plant visit to New Jersey Zinc Co., Sterling Operations, New Jersey.
August 24, 1979	Plant visit to Cyprus Mines Corp., Cyprus Bagdad Operations, Arizona.
August 28, 1978	Plant visit to Homestake Mining Co., Black Hills Operations, South Dakota.
August 29, 1978	Plant visit to The Anaconda Company, Mineral Resources Group, Butte Operations, Montana.
August 30, 1978	Plant visit to Sunshine Mining Co., Sunshine Mine, Idaho.

Date	Activity
August 31, 1978	Plant visit to Earth Resources Co., DeLamar Silver Mine, Idaho.
October 1, 1978	Initiate work on Background Information Document.
December 4, 1978	Plant visit to Pickands, Mather & Co., Taconite Harbor Facility, Minnesota.
December 5, 1978	Plant visit to Duluth, Missabe, and Iron Range Railway Co., Two Harbors Facility, Minnesota.
December 5, 1978	Plant visit to Duluth, Missabe, and Iron Range Railway Co., Duluth Harbor Facility, Minnesota.
March 1, 1979	Plant visit to Union Carbide Corp., Hot Springs Operation, Arkansas.
March 8, 1979	Plant visit to Exxon Minerals Co., Highland Uranium Operations, Wyoming.
March 19, 1979	Plant visit to The Anaconda Company, Mineral Resources Group, New Mexico Operations.
April 30, 1979	Plant visit to E.I. DuPont de Nemours & Co., Inc., Highland Plant, Florida.
May 17, 1979	Plant visit to Union Carbide Corp., Emerson Operations, Nevada.
May 18, 1979	Plant visit to Magma Copper Co., San Manuel Division, Arizona.
July 25-26, 1979	Emission testing at Pickands, Mather & Co., Taconite Harbor Facility, Minnesota.
August 23-30, 1979	Emission testing at Climax Molybdenum Co., Henderson Operations, Colorado.
September 26 - October 1, 1979	Emission testing at Exxon Minerals Co., Highland Uranium Operations, Wyoming.
October 23-26, 1979	Emission testing at The Anaconda Company, Mineral Resources Group, Butte Operations, Montana.

Date	Activity
November 7, 1979	Plant visit to Martin Marietta Alumina, Inc., Kingshill Alumina Plant, Virgin Islands.
November 12-17, 1979	Emission testing at Cyprus Mines Corp., Cyprus Bagdad Operations, Arizona.
November 19-29, 1979	Emission testing at New Jersey Zinc Co., Sterling Operations, New Jersey.
December 4-8, 1979	Emission testing at Union Carbide Corp., Hot Springs Operations, Arkansas.
January 14-17, 1980	Emission testing at Homestake Mining Co., Black Hills Operations, South Dakota.
January 17, 1980	Plant visit to Earth Resources Co., Delamar Silver Mine, Idaho.
April 9-10, 1980	Plant visit to Inspiration Consolidated Copper Co., Inspiration, Arizona.
June 23-25, 1980	Emission testing at Reynolds Metals Co., Sherwin Alumina Plant, Texas.
April 29, 1981	National Air Pollution Control Techniques Advisory Committee Meeting (NAPCTAC).
June 16-17, 1981	Emission testing at Alumax Inc., Goose Creek, South Carolina

APPENDIX B. INDEX TO ENVIRONMENTAL IMPACT CONSIDERATIONS

Agency Guidelines for Preparing Regulatory Action Environmental Impact Statements (39 FR 37419)	Location Within the Background Information Document
(1) Background and summary of regulatory alternatives	The regulatory alternatives from which standards will be chosen for proposal are summarized in Chapter 1, Section 1.1.
Statutory basis for proposing standards	The statutory basis for proposing standards is summarized in Chapter 2, Section 2.1.
Relationship to other regulatory agency actions	The various relationships between the regulatory agency actions are discussed in Chapters 3, 7, and 8.
Industry affected by the regulatory alternatives	A discussion of the industry affected by the regulatory alternatives is presented in Chapter 3, Section 3.1. Further details covering the "business/economic" nature of the industry is presented in Chapter 9, Section 9.1.
Specific processes affected by the regulatory alternatives	The specific processes and facilities affected by the regulatory alternatives are summarized in Chapter 1, Section 1.1. A detailed technical discussion of the sources and processes affected by the regulatory alternatives is presented in Chapter 3, Section 3.2.
Availability of control technology	Information on the availability of control technology is given in Chapter 4.
Existing regulations	A discussion of existing regulations on the industry to be affected by the regulatory alternatives is included in Chapter 3, Section 3.3 and Chapter 8, Section 8.2.

(continued)

APPENDIX B. INDEX TO ENVIRONMENTAL IMPACT CONSIDERATIONS (concluded)

Agency Guidelines for Preparing Regulatory Action Environmental Impact Statements (39 FR 37419)	Location Within the Background Information Document
(2) Economic impact of the regulatory alternatives	
Costs	The costs of alternative control techniques are discussed in Chapter 8, Section 8.1. Other cost considerations affecting the metallic minerals processing industry are discussed in Chapter 8, Section 8.2.
Economic impacts	The economic impact of the regulatory alternatives on costs is discussed in Chapter 9, Section 9.2.
(3) Environmental impact of the regulatory alternatives	
Air pollution	The air pollution impact of the regulatory alternatives is discussed in Chapter 7, Section 7.1.
Water pollution	The water pollution impact of the regulatory alternatives is discussed in Chapter 7, Section 7.2.
Solid waste disposal	The solid waste disposal impact of the regulatory alternatives is discussed in Chapter 7, Section 7.3.
Energy impact	The energy impacts of the regulatory alternatives is discussed in Chapter 7, Section 7.4.
Noise impact	The noise impact of the regulatory alternatives is discussed in Chapter 7, Section 7.5.

APPENDIX C
SUMMARY OF TEST DATA

Numerous sources were tested by EPA to evaluate the best systems of particulate-emission control available for metallic mineral plant process operations. These process operations include crushers, screens, dryers, storage bins, truck and railcar loading and unloading operations, other material handling operations,and conveyor transfer points. The tables presented in this appendix summarize the emission points and test parameters at each process tested, the results of the particulate-emission tests, particle size distribution tests, and visible emission observations. Also included are tables summarizing the mathematical modelling of medium- and high-energy venturi scrubber performance on actual particulate emission sources.

Emissions data included in Appendix C were gathered from 17 mineral processing plants. Of the 17, 9 process metallic minerals and 8 process nonmetallic minerals. At the 17 plants, 39 control units were tested. Fourteen of these control units were wet scrubbers and 25 were baghouses. Table C-1 is a summary of the plants and process points tested. This table outlines the process operations ducted to each control device, the points where emissions were tested, and the type of tests performed at each point. A total of 55 tests of fugitive emissions at hoods or pick-up points are also reported in this appendix. Tables C-2 through C-241 summarize the actual results of the various tests performed at these plants. Included in these tables are results of particulate-emission tests (by EPA Method 5), particulate-size-distribution analysis (by cascade impactor method), and visible emissions observations (by Methods 9 and 22). Tables C-242 through C-246 summarize the venturi scrubber mathematical modelling data. The data predicts the performance of 15-inch pressure drop and 30-inch pressure drop venturi scrubbers on actual measured emission points. The modeling was performed according to guidelines set forth in the document SR-52 Programmable Calculator Programs for Venturi Scrubbers and Electrostatic Precipitators (EPA-600/7-78-026).

Table C-1. TESTS PERFORMED AT METALLIC AND NON-METALLIC MINERAL PROCESSING PLANTS

Plant/ ore type	Control unit	Average process rate (TPH)	Test point	Type tests performed[a]
A/Copper	A-1 Baghouse	60.4	Truck loadout conveyor	5,PS
			Truck loadout hood	5,PS
			Baghouse outlet	5,9
			Truck dump hopper hood (fugitive)	9,22
			Railroad car loading chute (fugitive)	9,22
	A-1 Scrubber	2,567	Total inlet	5,PS
			Primary crusher conveyor exhaust	5,PS
			Primary crusher surge bin exhaust	5,PS
			Scrubber outlet	5,PS,9
	A-2 Scrubber	599	Secondary crusher scrubber inlet (total inlet)	5,PS
			Secondary crusher exhaust (inlet to scrubber)	5,PS
			Scrubber outlet	5,PS,9
			Secondary crusher tunnel outlet (fugitive)	9,22
			Secondary crusher reclaim feeder hood (fugitive)	9,22
B/Molybdenum	B-1 Scrubber		Primary crusher transfer points exhaust duct	5,PS,9,22
			Primary crusher, crusher pit exhaust duct	5,PS
			Primary crusher, scrubber outlet	5,PS,9
			Railroad car unloading (fugitive)	9,22
			Crusher building (fugitive)	9,22

(continued)

Table C-1. (Continued)

Plant/ ore type	Control unit	Average process rate (TPH)	Test point	Type tests performed[a]
	B-2 Scrubber		Pebble screening & milling, total scrubber inlet	5,PS
			Pebble screening & milling, screen exhaust duct	5,PS
			Pebble screening & milling, bucket elevator exhaust duct	5,PS
			Pebble screening & milling, scrubber outlet	5,PS,9
			Bucket elevator exhaust hood (fugitive)	9,22
			Pebble screen hood (fugitive)	9,22
	B-3 Scrubber		Molybdenum dryer, scrubber inlet	5,PS
			Molybdenum dryer, scrubber outlet	5,PS,9
			Dryer area (fugitive)	9,22
C/Uranium	C-1 Scrubber	365	Crusher scrubber inlet duct	5,PS
			Crusher transfer point exhaust (inlet to scrubber)	5,PS
			Crusher pressure grizzley exhaust (inlet to scrubber)	5,PS
			Crusher scrubber outlet duct	5,PS,9
			Crusher transfer point area (fugitive)	9,22
			Grizzly hood & crusher entrance process hoods (fugitive)	9,22
			Crusher grizzly (fugitive)	9,22

(continued)

Table C-1. (Continued)

Plant/ ore type	Control unit	Average process rate (TPH)	Test point	Type tests performed[a]
	C-2 Scrubber	349	Fine ore bins scrubber inlet duct	5,PS,9
			Fine ore bins hopper exhaust	5,PS
			Fine ore bins scrubber outlet duct	5,PS,9
			Fine ore bins hopper exhaust process area (fugitive)	9,22
	C-3 Scrubber		Packaging area exhaust duct	5,PS
			Packaging area (fugitive)	9,22
	C-4 Scrubber		Dryer scrubber inlet duct	5,PS
			Dryer scrubber outlet duct	5,PS,9
D/Vanadium	D-1 Scrubber		Dryer scrubber inlet, north	5,PS
			Dryer scrubber inlet, south	5,PS
			Dryer cyclone inlet, north	5,PS
			Dryer cyclone inlet, south	5,PS
			Dryer scrubber outlet	5,9
			Dryer conveyor or transfer point (fugitive)	9,22
	D-2 Scrubber		Grinder conveyor inlet (fugitive)	9,22
E/Iron	E-1 Scrubber		Secondary & tertiary crusher, rotoclone discharge stack, west	5,9

(continued)

Table C-1. (Continued)

Plant/ ore type	Control unit	Average process rate (TPH)	Test point	Type tests performed[a]
F/Iron	F-1 Baghouse		Secondary & tertiary crusher baghouse outlet	5,9
	F-2 Baghouse		Fine crusher conveyor to concentrator baghouse inlet	5
			Fine crusher conveyor to concentrator baghouse outlet	5,9
	F-3 Baghouse		Ore car dump, baghouse outlet	5,9
	F-1 Scrubber		Fine crusher, scrubber outlet	5
G/Copper	G-1 Baghouse	2,118	Crusher baghouse, total inlet	5,PS
			Crusher grizzly east duct	5,PS
			Crusher hood duct	5,PS
			Crusher baghouse, outlet duct	5,PS,9
			Coarse ore transfer point (fugitive)	9,22
			East grizzly screen (fugitive)	9,22
			West grizzly screen (fugitive)	9,22
	G-2 Baghouse	2,255	Truck dump baghouse inlet duct	5,PS
			Truck dump baghouse outlet duct	5,PS,9

(continued)

Table C-1. (Continued)

Plant/ ore type	Control unit	Average process rate (TPH)	Test point	Type tests performed[a]
H/Aluminum	H-1 Baghouse		Fine ore storage bins outlet	5,9
	H-1 Scrubber		Ship unloading area, scrubber inlet	5
			Ship unloading area, scrubber outlet	5,PS,9
I/Gold	I-1 Baghouse	124	Primary crusher inlet to baghouse	5,PS,9,22
			Secondary and Tertiary crusher (conveyor transfer) inlet to baghouse	5,PS
			Ore storage reclaim, inlet to baghouse	5,PS
			Baghouse outlet	5,PS,9
			Crusher building (fugitive)	9,22
			Grizzly screen area (fugitive)	9,22
			Conveyor transfer inlet (fugitive)	9,22
J/Limestone	J-1 Baghouse	1,011	Primary crusher baghouse outlet	5,9
			Primary impact crusher discharge (fugitive)	9
	J-2 Baghouse	1,015	Primary crusher screen, baghouse outlet	5,9
	J-3 Baghouse	899	Primary crusher transfer point baghouse outlet	5,9
			Conveyor transfer point (fugitive)	9

(continued)

Table C-1. (Continued)

Plant/ ore type	Control unit	Average process rate (TPH)	Test point	Type tests performed[a]
	J-4 Baghouse	163	Secondary screen/crusher, baghouse outlet	5,9
K/Limestone	K-1 Baghouse	353	Primary crusher, baghouse inlet	5
			Primary crusher, baghouse outlet	5,9
	K-2 Baghouse	270	Secondary crusher, baghouse outlet	5,9
			Scalping screen (fugitive)	9
			Hammer mill (fugitive)	9
			Surge bin (fugitive)	9
			Secondary crusher #1 (fugitive)	9
			Secondary crusher #2 (fugitive)	9
			Secondary crusher #3 (fugitive)	9
			3 deck finishing screen (L) (fugitive)	9
			3 deck finishing screen (R) (fugitive)	9
L/Limestone	L-1 Baghouse	123	Scalping screen/hammer mill, inlet to baghouse	5,9
			Primary crusher, inlet to baghouse	5
			Baghouse outlet	5

(continued)

Table C-1. (Continued)

Plant/ ore type	Control unit	Average process rate (TPH)	Test point	Type tests performed[a]
	L-2 Baghouse	123	Sizing screens, conveyor transfer points; baghouse inlet	5
			Sizing screens, conveyor transfer points; baghouse outlet	5,9
M/Traprock	M-1 Baghouse	225	Secondary tertiary crushers & associated screens; baghouse outlet	5,9
			No. 1 tertiary gyrasphere cone crusher (fugitive)	9
			No. 2 tertiary gyrasphere cone crusher (fugitive)	9
			Secondary standard cone crusher (fugitive)	9
			Scalping screen (fugitive)	9
			Secondary (2-deck) sizing screen (fugitive)	9
			Secondary (3-deck) sizing screen (fugitive)	9
	M-2 Baghouse	225	Final sizing screens & associated transfer and discharge points; baghouse outlet	5,9
N/Traprock	N-1 Baghouse	395	Tertiary crushers, associated screens & transfer points baghouse outlet	5,9
	N-2 Baghouse	395	Finishing screens & conveyor transfer points; baghouse outlet	5,9

(continued)

Table C-1. (Continued)

Plant/ ore type	Control unit	Average process rate (TPH)	Test point	Type tests performed[a]
O/Feldspar	O-1 Baghouse		#2 Pebble mill baghouse, north inlet	5,PS
			#2 Pebble mill baghouse, south inlet	5,PS
			Pebble mill baghouse outlet	5,9
			Ball mill (feed end) (fugitive)	9
			Ball mill (discharge end) (fugitive)	9
			Indoor transfer point #1 (fugitive)	9
			Indoor transfer point #2 (fugitive)	9
			Truck loading (fugitive)	9
			Railroad car loading (fugitive)	9
P/Kaolin	P-1 Baghouse		Raymond mill baghouse inlet	5,PS
			Raymond mill baghouse outlet	5,9
	P-2 Baghouse		Roller mill baghouse inlet	5,PS
			Roller mill baghouse outlet	5,9
Q/Fullers Earth	Q-1 Baghouse		Raymond mill baghouse inlet	5,PS
			Raymond mill baghouse outlet	5,9
	Q-2 Baghouse		#2 fluid energy mill, baghouse inlet	5,PS
			#2 fluid energy mill, baghouse outlet	5,9

(continued)

Table C-1. (Concluded)

Plant/ ore type	Control unit	Average process rate (TPH)	Test point	Type tests performed[a]
R/Gypsum	R-1 Baghouse		Hammer mill	9
S/Mica	S-1 Baghouse		Bagging operation	9
T/Talc	T-1 Baghouse		Vertical mill, Secondary crusher, Bagger, Pebble mill	9 9 9 9

[a] 5 = EPA Method 5, particulate emissions
PS = Particle size distribution method
9 = EPA Method 9, visible emissions
22 = EPA Method 22, visible emissions

Table C-2. SUMMARY OF EMISSIONS TEST RESULTS; BAGHOUSE A-1 TRUCK LOADOUT CONVEYOR, INLET TO BAGHOUSE A-1

Run number		7	8	9	Average
Date		11/16/79	11/17/79	11/17/79	
Test time - minutes		56	48	48	
Production rate	Mg/hr	63.2	52.7	48.6	54.8
	(TPH)	(69.7)	(58.1)	(53.6)	(60.4)
Stack Effluent					
Flow rate	m^3/min	37	39	37	38
	(acfm)	(1320)	(1370)	(1320)	(1337)
Flow rate	DNm^3/min	32	33	32	32
	(dscfm)	(1130)	(1180)	(1130)	(1147)
Temperature	°C	24.6	16.9	20.2	20.6
	(°F)	(76.3)	(62.3)	(68.3)	(69.0)
Water vapor	Vol%	0.2	2.1	1.1	1.1
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		1.382	1.123	2.288	1.598
(gr/dscf)		(0.604)	(0.491)	(1.00)	(0.695)
g/m^3		1.193	0.974	1.962	1.376
(gr/acf)		(0.521)	(0.426)	(0.857)	(0.601)
kg/hr		2.7	2.3	4.4	3.1
(lb/hr)		(5.9)	(5.0)	(9.7)	(6.9)
kg/Mg		0.043	0.044	0.091	0.059
(lb/ton)		(0.086)	(0.088)	(0.182)	(0.118)

Table C-3. SUMMARY OF EMISSIONS TEST RESULTS; BAGHOUSE A-1
TRUCK LOADOUT HOOD, INLET TO BAGHOUSE A-1

Run number		7	8	9	Average
Date		11/16/79	11/17/79	11/17/79	
Test time - minutes		60	60	60	60
Production rate	Mg/hr	63.2	52.7	48.6	54.8
	(TPH)	(69.7)	(58.1)	(53.6)	(60.4)
Stack Effluent					
Flow rate	m^3/min	50	51	50	51
	(acfm)	(1780)	(1810)	(1780)	(1790)
Flow rate	DNm^3/min	44	45	44	44
	(dscfm)	(1540)	(1580)	(1550)	(1557)
Temperature	°C	23.0	15.2	19.1	19.1
	(°F)	(73.3)	(59.3)	(66.3)	(66.3)
Water vapor	Vol%	0.4	1.2	0.5	0.7
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.127	0.066	0.022	0.072
(gr/dscf)		(0.056)	(0.029)	(0.010)	(0.031)
g/m^3		0.110	0.058	0.018	0.062
(gr/acf)		(0.048)	(0.025)	(0.008)	(0.027)
kg/hr		0.33	0.18	0.05	0.19
(lb/hr)		(0.73)	(0.39)	(0.12)	(0.41)
kg/Mg		0.005	0.003	0.001	0.003
(lb/ton)		(0.010)	(0.006)	(0.002)	(0.006)

Table C-4. SUMMARY OF EMISSIONS TEST RESULTS; BAGHOUSE A-1 BAGHOUSE OUTLET

Run number		1	2	3	Average
Date		11/16/79	11/17/79	11/17/79	
Test time - minutes		56	54	58	56
Production rate	Mg/hr	63.2	52.7	48.6	54.8
	(TPH)	(69.7)	(58.1)	(53.6)	(60.4)
Stack Effluent					
Flow rate	m^3/min	84	88	85	85
	(acfm)	(2950)	(3100)	(2990)	(3013)
Flow rate	DNm^3/min	72	76	72	73
	(dscfm)	(2530)	(2690)	(2550)	(2590)
Temperature	°C	26.9	16.9	22.4	22.0
	(°F)	(80.3)	(62.3)	(72.3)	(71.6)
Water vapor	Vol%	0.6	1.9	1.2	1.2
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.020	0.036	0.035	0.030
(gr/dscf)		(0.009)	(0.016)	(0.015)	(0.013)
g/m^3		0.016	0.031	0.030	0.026
(gr/acf)		(0.007)	(0.014)	(0.013)	(0.011)
kg/hr		0.08	0.16	0.15	0.13
(lb/hr)		(0.18)	(0.36)	(0.33)	(0.29)
kg/Mg		0.001	0.003	0.003	0.002
(lb/ton)		(0.002)	(0.006)	(0.006)	(0.002)

Table C-5. PARTICULATE SIZE DISTRIBUTION; BAGHOUSE A-1 TRUCK LOADOUT CONVEYOR, INLET TO BAGHOUSE A-1

Run number	7
Date	11/10/79
Test time (min)	13.9
Water vapor %	0.2
Stack temperature °C	24.4
(°F)	(76.0)
Sampling rate m^3/min	0.026
(acfm)	(0.93)
Volume of sample, cf	12.98

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	$\geq$10.08	208.80	65.18
2	10.08 - 6.42	56.00	17.48
3	6.42 - 4.23	34.00	10.11
4	4.23 - 2.92	13.90	4.33
5	2.92 - 1.87	5.30	1.65
6	1.87 - 0.95	2.90	0.90
7	0.95 - 0.57	0.40	0.12
8	0.57 - 0.38	0.20	0.06
Filter	<0.38	0.40	0.12
Total weight (mg)		320.30	

(continued)

Table C-5. (Concluded)

Run number	8
Date	11/17/79
Test time (min)	7.83
Water vapor %	2.1
Stack temperature ^{o}C	16.7
(^{o}F)	(62.0)
Sampling rate m^3/min	0.030
(acfm)	(1.05)
Volume of sample, cf	8.09

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	$\geq$9.38	260.50	45.60
2	9.38 - 5.99	104.90	17.88
3	5.99 - 3.94	127.60	21.75
4	3.94 - 2.72	58.50	9.97
5	2.72 - 1.74	20.60	3.51
6	1.74 - 0.88	5.40	0.92
7	0.88 - 0.53	0.70	0.11
8	0.53 - 0.35	0.50	0.08
Filter	<0.35	0.80	0.13
Total weight (mg)		586.50	

Table C-6. PARTICULATE SIZE DISTRIBUTION; BAGHOUSE A-1 TRUCK LOADOUT EXHAUST HOOD, INLET TO BAGHOUSE A-1

Run number	7
Date	11/16/79
Test time (min)	35.0
Water vapor (%)	0.4
Stack temperature °C	22.8
(°F)	(73.0)
Sampling rate m^3/min	0.035
(acfm)	(1.22)
Volume of sample, cf	43.16

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	$\geq$8.73	91.00	42.68
2	8.73 - 5.59	40.60	19.04
3	5.59 - 3.67	39.80	18.66
4	3.67 - 2.53	24.00	11.25
5	2.53 - 1.62	8.60	4.03
6	1.62 - 0.82	5.00	2.34
7	0.83 - 0.49	0.90	0.42
8	0.49 - 0.32	1.10	0.51
Filter	<0.32	2.20	1.03
Total weight (mg)		213.20	

(continued)

Table C-6. (Concluded)

Run number	8
Date	11/17/79
Test time (min)	7.0
Water vapor %	1.2
Stack temperature °C	15.0
(°F)	(59.0)
Sampling rate m^3/min	0.037
(acfm)	(1.32)
Volume of sample, cf	9.48

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	$\geq$8.33	38.10	89.01
2	8.33 - 5.34	1.60	3.73
3	5.34 - 3.50	1.50	3.50
4	3.50 - 2.42	0.70	1.63
5	2.42 - 1.55	0.30	0.70
6	1.55 - 0.78	0.40	0.93
7	0.78 - 0.47	0.20	0.46
8	0.47 - 0.31	0.00	0
Filter	<0.31	0.00	0
Total weight (mg)		42.80	

Table C-7. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE A-1 TRUCK LOADOUT BAGHOUSE OUTLET (6 Minute Average)

Type of discharge	stack
Height of discharge point	70 ft
Description of sky	clear-overcast
Distance from observer to point	100 ft
Color of plume	white
Date	11/16-17/79

	Run 7 test time (1157-1400)	Run 8 test time (0805-1056)	Run 9 test time (1200-1445)
Set no	Average opacity	Average opacity	Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0		0
9			0

Table C-8. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE A-1 TRUCK DUMP HOPPER HOOD (INTERMITANT TEST)

(6 Minute Average)

Type of discharge	fugitive
Height of discharge point	15 ft
Description of sky	clear-overcast
Distance from observer to point	25 ft
Color of plume	white
Date	11/16-17-79

	Run 7 test time (1157-1415)	Run 8 test time (0803-1056)	Run 9 test time (1201-1446)
Set no	Average opacity	Average opacity	Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0		

Table C-9. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE A-1 TRUCK DUMP HOPPER HOOD

Type of discharge	fugitive
Height of discharge point	15 ft
Description of sky	clear-overcast
Distance from observer to point	25 ft
Color of plume	white

Test no.	7	8	9	Total
Date	11/16/79	11/17/79	11/17/79	
Test period	1158-0220	0805-1101	1202-0252	
Test duration (sec)	4380	4020	4020	12420
Duration of fugitive emissions (sec)	3678	1734	1721	7133
Fugitive emissions (%)	84.0	43.1	42.8	57.4

Table C-10. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE A-1 RAILROAD CAR LOADING CHUTE (INTERMITANT SOURCE) (6 Minute Average)

Type of discharge	fugitive
Height of discharge point	20 ft
Description of sky	clear-overcast
Distance from observer to point	100 ft
Color of plume	white
Date	11/16-17-79

	Run 7 test time (1157-1401)	Run 8 test time (0804-1057)	Run 9 test time (1202-1452)
Set no	Average opacity	Average opacity	Average opacity
1	0	5	0
2	0	5	0
3	5	5	0
4	5	5	0
5	0	5	5
6	0	5	0
7	5	0	0
8			0
9			0

Table C-11. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE A-1 RAILROAD CAR LOADING CHUTE

Type of discharge	fugitive
Height of discharge point	20 ft
Description of sky	clear-overcast
Distance from observer to point	100 ft
Color of plume	white

Test no.	7	8	9	Total
Date	11/16/79	11/17/79	11/17/79	
Test period	1158-1420	0805-1101	1202-1452	
Test duration (sec)	4320	3960	4080	12360
Duration of fugitive emissions (sec)	3429	3234	3037	9700
Fugitive emissions (%)	79.4	81.7	74.4	78.5

Table C-12. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER A-1
PRIMARY CRUSHER SCRUBBER INLET (TOTAL)

Run number		1	2	3	Average
Date		11/13/79	11/13/79	11/13/79	
Test time - minutes		56	56	56	56
Production rate	Mg/hr	2511	Not	2740	2625
	(TPH)	(2763)	Available	(3021)	(2888)
Stack Effluent					
Flow rate	m^3/min	215	209	210	211
	(acfm)	(7590)	(7380)	(7430)	(7467)
Flow rate	DNm^3/min	199	186	186	190
	(dscfm)	(7010)	(6560)	(6570)	(6713)
Temperature	°C	14.6	19.6	19.1	17.8
	(°F)	(58.3)	(67.3)	(66.4)	(64.0)
Water vapor	Vol%	0	1.6	2.2	1.3
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.240	0.723	0.540	0.501
(gr/dscf)		(0.105)	(0.316)	(0.236)	(0.219)
g/m^3		0.225	0.646	0.476	0.449
(gr/acf)		(0.097)	(0.281)	(0.209)	(0.194)
kg/hr		2.9	8.1	6.0	5.7
(lb/hr)		(6.3)	(17.8)	(13.3)	(12.4)
kg/Mg		0.001	--	0.002	0.002
(lb/ton)		(0.002)	--	(0.004)	(0.004)

Table C-13. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER A-1 PRIMARY CRUSHER CONVEYOR EXHAUST, INLET TO SCRUBBER

Run number		1	2	3	Average
Date		11/13/79	11/13/79	11/13/79	
Test time - minutes		56	56	56	56
Production rate	Mg/hr (TPH)	2511 (2763)	Not Available	2740 (3021)	2625 (2888)
Stack Effluent					
Flow rate	m^3/min (acfm)	43 (1513)	45 (1590)	83 (2930)	57 (2011)
Flow rate	DNm^3/min (dscfm)	38 (1350)	40 (1410)	73 (2590)	50 (1783)
Temperature	°C (°F)	16 (61)	20 (68)	20 (68)	19 (66)
Water vapor	Vol%	1.9	1.0	1.1	1.3
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3 (gr/dscf)		0.134 (0.059)	0.210 (0.092)	0.160 (0.070)	0.168 (0.073)
g/m^3 (gr/acf)		0.120 (0.052)	0.185 (0.081)	0.137 (0.060)	0.147 (0.064)
kg/hr (lb/hr)		0.31 (0.68)	0.50 (1.1)	0.68 (1.5)	0.50 (1.09)
kg/Mg (lb/ton)		0.0001 (0.0002)	-- --	0.0002 (0.0004)	0.0002 (0.0004)

Table C-14. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER A-1 PRIMARY CRUSHER SURGE BIN EXHAUST, INLET TO SCRUBBER

Run number		1	2	3	Average
Date		11/13/79	11/13/79	11/13/79	
Test time - minutes		60	60	60	60
Production rate	Mg/hr (TPH)	2511 (2763)	Not Available	2740 3021	2625 (2888)
Stack Effluent					
Flow rate	m^3/min (acfm)	59.5 (2100)	60.0 (2120)	58.9 (2080)	59.5 (2100)
Flow rate	DNm^3/min (dscfm)	53.2 (1880)	52.4 (1850)	51.5 (1820)	52.4 (1850)
Temperature	°C (°F)	16 (61)	20 (67)	19 (66)	18 (65)
Water vapor	Vol%	1.2	2.2	2.2	1.9
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3 (gr/dscf)		2.123 (0.928)	1.604 (0.701)	1.972 (0.862)	1.900 (0.830)
g/m^3 (gr/acf)		1.907 (0.833)	1.398 (0.611)	1.733 (0.757)	1.679 (0.734)
kg/hr (lb/hr)		6.8 (15.0)	5.0 (11.1)	6.1 (13.5)	6.0 (13.2)
kg/Mg (lb/ton)		0.003 (0.006)	-- --	0.002 (0.004)	0.003 (0.005)

Table C-15. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER A-1 PRIMARY CRUSHER SCRUBBER OUTLET

Run number		1	2	3	Average
Date		11/13/79	11/13/79	11/13/79	
Test time - minutes		78	78	96	84
Production rate	Mg/hr (TPH)	2511 (2763)	Not Available	2740 (3021)	2625 (2888)
Stack Effluent					
Flow rate	m^3/min (acfm)	231 (8160)	224 (7920)	225 (7940)	227 (8007)
Flow rate	DNm^3/min (dscfm)	210 (7400)	200 (7080)	199 (7020)	203 (7167)
Temperature	°C (°F)	17.4 (63.3)	19.6 (67.3)	20.2 (68.4)	19.1 (66.3)
Water vapor	Vol%	1.3	1.2	2.1	1.5
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3 (gr/dscf)		0.025 (0.011)	0.027 (0.012)	0.022 (0.010)	0.025 (0.011)
g/m^3 (gr/acf)		0.022 (0.010)	0.023 (0.010)	0.019 (0.008)	0.022 (0.009)
kg/hr (lb/hr)		0.31 (.68)	0.31 (.69)	0.26 (.57)	0.29 (0.65)
kg/Mg (lb/ton)		0.0001 (0.0002)	-- --	0.0001 (0.0002)	0.0001 (0.0002)

Table C-16. PARTICULATE SIZE DISTRIBUTION; SCRUBBER A-1 PRIMARY CRUSHER, SCRUBBER INLET

Run number	1
Date	11/13/79
Test time (min)	20
Water vapor %	1.6
Stack temperature °C	19.4
(°F)	(67.0)
Sampling rate m^3/min	0.024
(acfm)	(0.83)
Volume of sample, cf	16.46

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	$\geq$10.61	127.00	71.72
2	10.61 - 6.75	19.10	10.73
3	6.75 - 4.45	12.60	7.08
4	4.45 - 3.07	5.80	3.26
5	3.07 - 1.06	6.00	3.37
6	1.06 - 1.00	6.10	3.42
7	1.00 - .60	.70	.39
8	.60 - .40	0.00	.00
Filter	<.40	0.00	.00
Total weight (mg)		177.90	

(continued)

Table C-16. (Continued)

Run number	2
Date	11/13/79
Test time (min)	15
Water vapor %	2.2
Stack temperature °C	18.9
(°F)	(66.0)
Sampling rate m^3/min	0.025
(acfm)	(0.87)
Volume of sample, cf	12.80

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	$\geq$10.38	230.80	60.64
2	10.38 - 6.60	105.50	27.72
3	6.60 - 4.35	31.60	8.30
4	4.35 - 3.01	5.85	1.53
5	3.01 - 1.92	3.40	.89
6	1.92 - .98	2.50	.65
7	.98 - .59	.60	.15
8	.59 - .39	.20	.05
Filter	<.39	.10	.02
Total weight (mg)		380.55	

(continued)

Table C-16. (Concluded)

Run number	3
Date	11/13/79
Test time (min)	15
Water vapor %	2.2
Stack temperature °C	18.9
(°F)	(66.0)
Sampling rate m^3/min	0.022
(acfm)	(0.76)
Volume of sample, cf	11.19

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	≥11.12	188.20	38.76
2	11.12 - 7.05	90.00	18.53
3	7.05 - 4.66	94.20	19.40
4	4.66 - 3.22	77.70	16.00
5	3.22 - 2.05	30.20	6.22
6	2.05 - 1.05	4.40	.90
7	1.05 - .63	.50	.10
8	.63 - .42	.30	.06
Filter	<.42	.00	.00
Total weight (mg)		485.50	

Table C-17. PARTICULATE SIZE DISTRIBUTION; SCRUBBER A-1 PRIMARY CRUSHER CONVEYOR EXHAUST, INLET TO SCRUBBER

Run number	1
Date	11/13/79
Test time (min)	20
Water vapor %	1.0
Stack temperature °C	19
(°F)	(67)
Sampling rate m^3/min	0.028
(acfm)	(0.99)
Volume of sample, cf	19.68

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	<9.82	79.80	61.71
2	9.82 - 6.26	23.80	18.40
3	6.26 - 4.12	10.00	7.73
4	4.12 - 2.85	5.90	4.56
5	2.85 - 1.82	6.00	4.64
6	1.82 - 0.92	3.30	2.55
7	0.92 - 0.55	0.40	0.30
8	0.55 - 0.37	0.10	0.07
Filter	<0.37	0	0
Total weight (mg)		129.30	

(continued)

Table C-17. (Continued)

Run number	2
Date	11/13/79
Test time (min)	15
Water vapor %	1.1
Stack temperature °C	20
(°F)	(68)
Sampling rate m^3/min	0.019
(acfm)	(0.66)
Volume of sample, cf	9.80

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>12.20	27.10	68.26
2	12.20 - 7.72	1.90	4.78
3	7.72 - 5.10	3.70	9.31
4	5.10 - 3.53	2.10	5.28
5	3.53 - 2.25	1.70	4.28
6	2.25 - 1.15	1.30	3.27
7	1.15 - 0.70	0.50	1.25
8	0.70 - 0.47	0.70	1.76
Filter	<0.47	0.70	1.76
Total weight (mg)		39.70	

(continued)

Table C-17. (Concluded)

Run number	3
Date	11/13/79
Test time (min)	20
Water vapor %	1.1
Stack temperature °C	20
(°F)	(68)
Sampling rate m^3/min	0.020
(acfm)	(0.72)
Volume of sample, cf	14.42

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>11.40	97.60	60.13
2	11.40 - 7.23	26.20	16.14
3	7.23 - 4.77	26.00	16.01
4	4.77 - 3.30	6.00	3.69
5	3.30 - 2.10	3.40	2.09
6	2.10 - 1.08	2.80	1.72
7	1.08 - 0.65	0.20	0.12
8	0.65 - 0.44	0.10	0.06
Filter	<0.44	0.00	0.00
Total weight (mg)		162.30	

Table C-18. PARTICULATE SIZE DISTRIBUTION; SCRUBBER A-1 PRIMARY CRUSHER SURGE BIN EXHAUST, INLET TO SCRUBBER

Run number	1
Date	11/13/80
Test time (min)	30
Water vapor %	6.2
Stack temperature °C	19
(°F)	(67)
Sampling rate m^3/min	0.021
(acfm)	(0.75)
Volume of sample, cf	22.07

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>11.21	670.00	94.36
2	11.21 - 7.11	4.50	0.63
3	7.11 - 4.69	7.00	0.98
4	4.69 - 3.25	5.70	0.80
5	3.25 - 2.07	8.70	1.22
6	2.07 - 1.06	9.90	1.39
7	1.06 - 0.64	3.70	0.52
8	0.64 - 0.43	0.50	0.07
Filter	<0.43	0.00	0.00
Total weight (mg)		710.00	

(continued)

Table C-18. (Continued)

Run number	2
Date	11/13/79
Test time (min)	15
Water vapor %	2.2
Stack temperature ^oC	19
(^oF)	(66)
Sampling rate m^3/min	0.022
(acfm)	(0.76)
Volume of sample, cf	11.29

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>11.07	298.90	97.55
2	11.07 - 7.03	1.00	0.32
3	7.03 - 4.64	1.10	0.35
4	4.64 - 3.21	1.00	0.32
5	3.21 - 2.05	2.00	0.65
6	2.05 - 1.05	1.90	0.62
7	1.05 - 0.63	0.50	0.16
8	0.63 - 0.42	0.00	0.00
Filter	<0.42	0.00	0.00
Total weight (mg)		306.40	

(continued)

Table C-18. (Concluded)

Run number	3
Date	11/13/79
Test time (min)	15
Water vapor %	2.2
Stack temperature °C	19
(°F)	(66)
Sampling rate m^3/min	0.021
(acfm)	(0.75)
Volume of sample, cf	11.05

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>11.19	1266.00	98.40
2	11.19 - 7.10	3.60	0.27
3	7.10 - 4.69	4.20	0.32
4	4.69 - 3.24	3.00	0.23
5	3.24 - 2.07	4.20	0.32
6	2.07 - 1.06	4.30	0.33
7	1.06 - 0.64	1.10	0.08
8	0.64 - 0.43	0.00	0.00
Filter	<0.43	0.10	0.00
Total weight (mg)		1286.50	

Table C-19. PARTICULATE SIZE DISTRIBUTION; SCRUBBER A-1 PRIMARY CRUSHER SCRUBBER OUTLET

Run number	1
Date	11/12/79
Test time (min)	90
Water vapor %	1.3
Stack temperature, ^{o}C	19.4
(^{o}F)	(67.0)
Sampling rate m^3/min	0.023
(acfm)	0.82
Volume of sample, cf	73.18

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	$\geq$10.69	15.40	61.11
2	10.69 - 6.79	.10	.39
3	6.79 - 4.48	.00	.00
4	4.48 - 3.10	1.20	4.76
5	3.10 - 1.98	2.00	7.93
6	1.98 - 1.01	4.30	17.06
7	1.01 - .61	1.80	7.14
8	.61 - .41	.30	1.19
Filter	<.41	.10	.39
Total weight (mg)		25.20	

Table C-20. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER A-1 PRIMARY CRUSHER SCRUBBER OUTLET (6 Minute Average)

Type of discharge	stack
Height of discharge point	30 ft
Description of sky	clear
Distance from observer to point	100 ft
Color of plume	white
Date	11/13/79

	Run 1 test time (0913-1037)	Run 2 test time (1340-1458)	Run 3 test time (1640-1728)
Set no	Average opacity	Average opacity	Average opacity
1	10	5	10
2	5	5	10
3	5	5	10
4	10	5	5
5	5	5	5
6	5	5	5
7	5	5	10
8	5	5	5
9	5	10	
10	5	10	
11	5	10	
12	10	5	
13	5		
14	5		

Table C-21. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER A-2 SECONDARY CRUSHER SCRUBBER INLET (TOTAL INLET)

Run number		4	5	6	Average
Date		11/14/79	11/15/79	11/15/79	
Test time - minutes		60	60	60	60
Production rate	Mg/hr (TPH)	* *	* *	* *	* *
Stack Effluent					
Flow rate	m^3/min (acfm)	278 (9810)	260 (9180)	274 (9690)	271 (9560)
Flow rate	DNm^3/min (dscfm)	234 (8270)	223 (7880)	234 (8250)	230 (8133)
Temperature	°C (°F)	19.1 (66.4)	16.3 (61.3)	19.1 (66.4)	18.2 (64.7)
Water vapor	Vol%	1.3	1.2	1.3	1.3
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3 (gr/dscf)		0.766 (0.335)	0.577 (0.252)	0.524 (0.229)	0.622 (0.272)
g/m^3 (gr/acf)		0.645 (0.282)	0.494 (0.216)	0.446 (0.195)	0.529 (0.231)
kg/hr (lb/hr)		10.8 (23.7)	7.7 (17.0)	7.3 (16.2)	8.6 (19.0)
kg/Mg (lb/ton)		* *	* *	* *	* *

---

* Because the secondary crusher scrubber inlet services both the secondary crusher and ore reclaim systems, and because both of these systems operate at different production rates, a production rate applicable to the total scrubber inlet cannot be calculated.

Table C-22. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER A-2 SECONDARY CRUSHER EXHAUST, INLET TO SCRUBBER

Run number		1	2	3	Average
Date		11/14/79	11/15/79	11/15/79	
Test time - minutes		60	60	60	60
Production rate	Mg/hr	183	194	196	191
	(TPH)	(202)	(213)	(215)	(210)
Stack Effluent					
Flow rate	m^3/min	58	61	61	60
	(acfm)	(2060)	(2140)	(2140)	(2113)
Flow rate	DNm^3/min	50	52	52	51
	(dscfm)	(1750)	(1850)	(1830)	(1810)
Temperature	°C	22	19	21	21
	(°F)	(71)	(67)	(69)	(69)
Water vapor	Vol%	2.2	1.7	2.4	2.1
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		4.28	1.876	2.068	2.741
(gr/dscf)		(1.87)	(0.820)	(0.904)	(1.198)
g/m^3		3.64	1.622	1.771	2.343
(gr/acf)		(1.59)	(0.709)	(0.774)	(1.024)
kg/hr		12.7	5.9	6.4	8.3
(lb/hr)		(28.0)	(13.0)	(14.2)	(18.4)
kg/Mg		0.069	0.030	0.033	0.043
(lb/ton)		(0.139)	(0.061)	(0.066)	(0.088)

Table C-23. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER A-2 SECONDARY CRUSHER SCRUBBER OUTLET

Run number		4	5	6	Average
Date		11/14/79	11/15/79	11/15/79	
Test time - minutes		96	96	96	96
Production rate	Mg/hr	*	*	*	*
	(TPH)	*	*	*	*
Stack Effluent					
**Flow rate	m^3/min	722	705	705	711
	(acfm)	(25500)	(24900)	(24900)	(25100)
**Flow rate	DNm^3/min	626	615	612	617
	(dscfm)	(22100)	(21700)	(21600)	(21800)
Temperature	°C	17.9	16.8	18.5	17.7
	(°F)	(64.2)	(62.2)	(65.3)	(63.9)
Water vapor	Vol%	1.9	2.3	2.5	2.2
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.054	0.027	0.043	0.041
(gr/dscf)		(0.023)	(0.012)	(0.019)	(0.018)
g/m^3		0.046	0.023	0.038	0.035
(gr/acf)		(0.020)	(0.010)	(0.016)	(0.015)
**kg/hr		2.0	1.0	1.6	1.5
(lb/hr)		(4.4)	(2.1)	(3.5)	(3.3)
**kg/Mg		*	*	*	*
(lb/ton)		*	*	*	*

---

*Because the secondary crusher scrubber inlet services both the secondary crusher and ore reclaim systems, and because both of these systems operate at different production rates, a production rate applicable to the total scrubber inlet cannot be calculated.

**These results subject to revision due to cyclonic flow at the outlet.

Table C-24. PARTICULATE SIZE DISTRIBUTION; SCRUBBER A-2 SECONDARY CRUSHER SCRUBBER INLET (TOTAL INLET)

Run number	4
Date	11/15/79
Test time (min)	20
Water vapor %	1.2
Stack temperature °C	16
(°F)	(61)
Sampling rate m^3/min	0.031
(acfm)	(1.09)
Volume of sample, cf	21.68

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	≥9.19	175.20	68.11
2	9.19 - 5.87	43.50	16.91
3	5.87 - 3.86	18.30	7.11
4	3.86 - 2.66	8.90	3.46
5	2.66 - 1.70	6.90	2.68
6	1.70 - .86	4.40	1.71
7	.86 - .52	.00	.00
8	.52 - .34	.00	.00
Filter	<.34	.00	.00
Total weight (mg)		257.20	

(continued)

Table C-24. (Continued)

Run number	5
Date	11/15/79
Test time (min)	10
Water vapor %	1.3
Stack temperature °C	18.9
(°F)	(66.0)
Sampling rate m^3/min	0.032
(acfm)	(1.13)
Volume of sample	

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	≥9.08	104.00	68.42
2	9.08 - 5.80	22.30	14.67
3	5.80 - 3.81	11.10	7.30
4	3.81 - 2.63	7.00	4.60
5	2.63 - 1.68	5.00	3.28
6	1.68 - .85	2.30	1.51
7	.85 - .51	.20	.13
8	.51 - .34	.10	.06
Filter	<.34	.00	.00
Total weight (mg)		152.00	

(continued)

Table C-24. (Concluded)

Run number	6
Date	11/15/79
Test time (min)	5
Water vapor %	1.3
Stack temperature °C	18.9
(°F)	(66.0)
Sampling rate m^3/min	0.032
(acfm)	(1.13)
Volume of sample, cf	5.53

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	≥9.09	49.00	59.75
2	9.09 - 5.81	12.80	15.60
3	5.81 - 3.81	8.30	10.12
4	3.81 - 2.64	5.30	6.46
5	2.64 - 1.68	3.60	4.39
6	1.68 - .85	1.70	2.07
7	.85 - .51	.20	.24
8	.51 - .34	.50	.60
Filter	<.34	.60	.73
Total weight (mg)		82.00	

Table C-25. PARTICULATE SIZE DISTRIBUTION; SCRUBBER A-2 SECONDARY CRUSHER EXHAUST, INLET TO SCRUBBER

Run number	1
Date	11/15/79
Test time (min)	20
Water vapor %	1.7
Stack temperature °C	19
(°F)	(67)
Sampling rate m^3/min	0.023
(acfm)	(0.81)
Volume of sample, cf	16.02

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	≥10.75	390.20	93.48
2	10.75 - 6.83	7.00	1.67
3	6.83 - 4.50	4.80	1.14
4	4.50 - 3.11	4.60	1.10
5	3.11 - 1.99	4.40	1.05
6	1.99 - 1.01	5.00	1.19
7	1.01 - 0.61	1.00	0.23
8	0.61 - 0.41	0.40	0.09
Filter	<0.41	0.00	0.00
Total weight (mg)		417.40	

(continued)

Table C-25. (Continued)

Run number	2
Date	11/15/79
Test time (min)	10
Water vapor %	1.7
Stack temperature °C	19
(°F)	(67)
Sampling rate m^3/min	0.024
(acfm)	(0.86)
Volume of sample, cf	8.52

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	≥10.42	441.30	90.20
2	10.42 - 6.62	21.40	4.37
3	6.62 - 4.36	11.30	2.30
4	4.36 - 3.02	4.90	1.00
5	3.02 - 1.93	5.40	1.10
6	1.93 - 0.98	4.20	0.85
7	0.98 - 0.59	0.60	0.12
8	0.59 - 0.39	0.10	0.02
Filter	<0.39	0	0
Total weight (mg)		489.20	

(continued)

Table C-25. (Concluded)

Run number	3
Date	11/15/79
Test time (min)	5
Water vapor %	2.4
Stack temperature °C	21
(°F)	(69)
Sampling rate m^3/min	0.024
(acfm)	(0.85)
Volume of sample, cf	4.20

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	≥10.47	79.20	47.48
2	10.47 - 6.66	40.60	24.34
3	6.66 - 4.39	27.20	16.30
4	4.39 - 3.03	12.70	7.61
5	3.03 - 1.94	4.10	2.45
6	1.94 - 0.99	2.50	1.49
7	0.99 - 0.59	0.30	0.17
8	0.59 - 0.40	0.20	0.11
Filter	<0.40	0.00	0.00
Total weight (mg)		166.80	

Table C-26. PARTICULATE SIZE DISTRIBUTION; SCRUBBER A-2 SECONDARY CRUSHER SCRUBBER OUTLET

Run number	1
Date	11/15/79
Test time (min)	90
Water vapor %	2.5
Stack temperature ^oC	18.3
(^oF)	(65.0)
Sampling rate m^3/min	0.020
(acfm)	(0.70)
Volume of sample, cf	62.28

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	$\geq$11.54	21.20	86.53
2	11.54 - 7.31	.20	.81
3	7.31 - 4.83	.30	1.22
4	4.83 - 3.34	.30	1.22
5	3.34 - 2.13	.60	2.44
6	2.13 - 1.09	1.00	4.08
7	1.09 - .66	.80	3.26
8	.66 - .44	.10	.40
Filter	<.44	.00	.00
Total weight (mg)		24.50	

Table C-27. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER A-2 SECONDARY CRUSHER SCRUBBER OUTLET (6 Minute Average)

Type of discharge	stack
Height of discharge point	50 ft
Description of sky	clear
Distance from observer to point	50 ft
Color of plume	white
Date	11/14/79

Set no	Run 1 test time (1533-1715) Average opacity	Run 2 test time (0804-1008) Average opacity	Run 3 test time (1110-1258) Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	0
17	0	0	0
18		0	0
19		0	

Table C-28. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER A-2
SECONDARY CRUSHER TUNNEL OUTLET
(6 Minute Average)

Type of discharge	fugitive
Height of discharge point	6 ft
Description of sky	clear-cloudy
Distance from observer to point	15 ft
Color of plume	white
Date	11/14-15/79

	Run 4 test time (1420-1520; 1533-1633; 1645-1715)	Run 5 test time (0802-0856; 0905-1005)	Run 6 test time (1100-1202; 1205-1305)
Set no	Average opacity	Average opacity	Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	0
17	0	0	0
18	0	0	0
19	0	0	0
20	0		0
21	0		
22	0		
23	0		
24	0		
25	0		

Table C-29. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER A-2 SECONDARY CRUSHER TUNNEL OUTLET

Type of discharge	fugitive
Height of discharge point	6 ft
Description of sky	clear-cloudy
Distance from observer to point	15 ft
Color of plume	white

Test no.	4	5	6	Total
Date	11/14/79	11/15/79	11/15/79	
Test period	1420-1717	0802-1005	1100-1305	
Test duration (sec)	9120	7200	7200	23520
Duration of fugitive emissions (sec)	0	0	0	0
Fugitive emissions (%)	0	0	0	0

Table C-30. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER A-2 SECONDARY CRUSHER RECLAIM FEEDER HOOD (6 Minute Average)

Type of discharge	fugitive
Height of discharge point	1 ft
Description of sky	N/A (indoors)
Distance from observer to point	7 ft
Color of plume	white
Date	11/14-15/79

	Run 4 test time (1420-1730)	Run 5 test time (0800-1000)	Run 6 test time (1115-1257)
Set no	Average opacity	Average opacity	Average opacity
1	0	0	0
2	0	5	0
3	0	0	0
4	0	0	0
5	0	5	0
6	0	5	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	
17	0	0	
18	0	0	
19	0	0	
20	0	0	
21	0		
22	0		
23	0		
24	0		
25	0		

Table C-31. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER A-2 SECONDARY CRUSHER RECLAIM FEEDER HOOD

Type of discharge	fugitive
Height of discharge point	1 ft
Description of sky	N/A (indoors)
Distance from observer to point	7-10 ft
Color of plume	white

Test no.	4	5	6	Total
Date	11/14/79	11/15/79	11/15/79	
Test period	1420-1730	0905-0945	1120-1255	
Test duration (sec)	9000	5408	5130	19538
Duration of fugitive emissions (sec)	0	913	352	1265
Fugitive emissions (%)	0	16.9	6.9	6.5

Table C-32. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER B-1 PRIMARY CRUSHER, TRANSFER POINTS EXHAUST DUCT (SPRAYS ON)

Run number		1	2	3	Average
Date		8/27/79	8/27/79	8/27/79	
Test time - minutes		120	120	120	120
Stack Effluent					
*Flow rate	m^3/min (acfm)	636 (22475)	634 (22404)	639 (22555)	637 (22478)
*Flow rate	DNm^3/min (dscfm)	455 (16054)	449 (15869)	455 (16064)	453 (15996)
Temperature	°C (°F)	17.6 (63.8)	18.6 (65.4)	17.3 (63.1)	17.8 (64.1)
Water vapor	Vol%	1.5	2.0	1.9	1.8
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3 (gr/dscf)		0.23 (0.101)	0.59 (0.257)	0.38 (0.165)	0.40 (0.174)
g/m^3 (gr/acf)		0.16 (0.072)	0.42 (0.182)	0.27 (0.118)	0.28 (0.124)
*kg/hr (lb/hr)		6.29 (13.86)	15.83 (34.89)	10.33 (22.77)	10.81 (23.84)

*These results subject to revision due to cyclonic flow at the outlet.

Table C-33. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER B-1 PRIMARY CRUSHER, CRUSHER PIT EXHAUST DUCT (SPRAYS ON)

Run number		1	2	3	Average
Date		8/27/79	8/27/79	8/27/79	
Test time - minutes		132	132	132	132
*Production rate	Mg/hr (TPH)	N/A N/A	N/A N/A	N/A N/A	N/A N/A
Stack Effluent					
**Flow rate	m^3/min (acfm)	944 (33322)	934 (32973)	944 (33335)	940 (33210)
**Flow rate	DNm^3/min (dscfm)	671 (23701)	668 (23603)	652 (23038)	664 (23447)
Temperature	°C (°F)	15.6 (60.0)	15.6 (60.0)	17.3 (63.2)	16.1 (61.1)
Water vapor	Vol%	2.4	1.7	1.8	2.0
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3 (gr/dscf)		0.25 (0.109)	0.25 (0.110)	0.21 (0.091)	0.24 (0.104)
g/m^3 (gr/acf)		0.18 (0.078)	0.18 (0.079)	0.14 (0.063)	0.17 (0.073)
**kg/hr (lb/hr)		10.08 (22.22)	10.14 (22.35)	8.13 (17.93)	9.45 (20.83)

*Confidential information.

**These results subject to revision due to cyclonic flow at the outlet.

Table C-34. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER B-1
PRIMARY CRUSHER, SCRUBBER OUTLET (SPRAYS ON)

Run number		1	2	3	Average
Date		8/27/79	8/27/79	8/27/79	
Test time - minutes		144	144	144	144
*Production rate	Mg/hr (TPH)	N/A N/A	N/A N/A	N/A N/A	N/A N/A
Stack Effluent					
**Flow rate	m^3/min (acfm)	4131 (145871)	4257 (150331)	4176 (147475)	4188 (147892)
**Flow rate	DNm^3/min (dscfm)	2991 (105617)	3061 (108102)	3022 (106705)	3024 (106808)
Temperature	°C (°F)	12.8 (55.0)	13.2 (55.7)	12.8 (55.1)	12.9 (55.3)
Water vapor	Vol%	2.5	3.0	2.5	2.7
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3 (gr/dscf)		0.020 (0.009)	0.008 (0.003)	0.008 (0.004)	0.012 (0.005)
g/m^3 (gr/acf)		0.014 (0.006)	0.005 (0.002)	0.006 (0.003)	0.009 (0.004)
**kg/hr (lb/hr)		3.52 (7.76)	1.39 (3.06)	1.53 (3.38)	2.15 (4.73)

*Confidential information.
**These results subject to revision due to cyclonic flow at the outlet.

Table C-35. PARTICULATE SIZE DISTRIBUTION; SCRUBBER B-1 PRIMARY CRUSHER, TRANSFER POINTS EXHAUST DUCT (SPRAYS ON)

Run number	1
Date	08/27/79
Test time (min)	6.70
Water vapor %	2.0
Stack temperature ^{o}C	18.3
(^{o}F)	(65.0)
Sampling rate m^3/min	0.012
(dscfm)	(0.289)
(acfm)	(0.410)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>15.29	11.81	31.4
2	15.29 - 9.54	4.21	11.19
3	9.54 - 6.46	5.57	14.81
4	6.46 - 4.40	4.12	10.95
5	4.40 - 2.82	4.60	12.23
6	2.82 - 1.41	4.30	11.43
7	1.41 - 0.87	1.42	3.78
8	0.87 - 0.57	0.64	1.70
Filter	<0.57	0.94	2.50
Total weight (mg)		37.61	

(continued)

Table C-35. (Continued)

Run number	2
Date	10/27/79
Test time (min)	5.70
Water vapor %	2.0
Stack temperature °C	18.3
(°F)	(65.0)
Sampling rate m^3/min	0.010
(dscfm)	(0.254)
(acfm)	(0.360)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>16.32	2.15	69.13
2	16.32 - 10.19	0.00	0
3	10.19 - 6.90	0.00	0
4	6.90 - 4.71	0.00	0
5	4.71 - 3.02	0.00	0
6	3.02 - 1.51	0.38	12.22
7	1.51 - 0.93	0.00	0
8	0.93 - 0.62	0.48	15.43
Filter	<0.62	0.10	3.22
Total weight (mg)		3.11	

(continued)

Table C-35. (Concluded)

Run number	3
Date	10/27/79
Test time (min)	6.25
Water vapor %	2.0
Stack temperature ^oC	18.3
(^oF)	(65.0)
Sampling rate m^3/min	0.012
(dscfm)	(0.310)
(acfm)	(0.440)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>14.75	34.06	65.99
2	14.75 - 9.21	3.22	6.24
3	9.21 - 6.24	2.91	5.64
4	6.24 - 4.25	3.25	6.30
5	4.25 - 2.72	2.14	4.15
6	2.72 - 1.36	3.72	7.21
7	1.36 - 0.83	1.12	2.17
8	0.83 - 0.55	0.42	0.81
Filter	<0.55	0.77	1.49
Total weight (mg)		51.61	

Table C-36. PARTICULATE SIZE DISTRIBUTION; SCRUBBER B-1 PRIMARY CRUSHER, CRUSHER PIT EXHAUST (SPRAYS ON)

Run number	1
Date	10/27/80
Test time (min)	4.00
Water vapor %	2.0
Stack temperature °C	15.6
(°F)	(60.0)
Sampling rate m^3/min	0.015
(dscfm)	(0.389)
(acfm)	(0.530)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>13.39	18.19	67.32
2	13.39 - 8.35	3.82	14.14
3	8.35 - 5.66	1.67	6.18
4	5.66 - 3.85	1.08	4.00
5	3.85 - 2.47	1.27	4.70
6	2.47 - 1.23	0.64	2.37
7	1.23 - 0.75	0.16	0.59
8	0.75 - 0.49	0.08	0.30
Filter	<0.49	0.11	0.41
Total weight (mg)		27.02	

(continued)

Table C-36. (Continued)

Run number	2
Date	10/27/79
Test time (min)	3.80
Water vapor %	2.0
Stack temperature °C	15.6
(°F)	(6.00)
Sampling rate m^3/min	0.015
(dscfm)	(0.385)
(acfm)	(0.540)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>13.26	10.06	28.35
2	13.26 - 8.27	2.89	8.15
3	8.27 - 5.60	5.47	15.42
4	5.60 - 3.81	3.40	9.58
5	3.81 - 2.44	7.84	22.10
6	2.44 - 1.21	1.71	4.82
7	1.21 - 0.74	1.67	4.71
8	0.74 - 0.48	2.39	6.74
Filter	<0.48	0.05	0.14
Total weight (mg)		35.48	

(continued)

Table C-36. (Concluded)

Run number	3
Date	10/27/79
Test time (min)	3.75
Water vapor %	2.0
Stack temperature °C	15.6
(°F)	(60.0)
Sampling rate m^3/min	0.016
(dscfm)	(0.393)
(acfm)	(0.550)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>13.14	8.45	57.33
2	13.14 - 8.20	1.91	12.96
3	8.20 - 5.55	1.53	10.38
4	5.55 - 3.78	1.07	7.26
5	3.78 - 2.42	0.83	5.63
6	2.42 - 1.20	0.93	6.31
7	1.20 - 0.73	0.00	0
8	0.73 - 0.48	0.00	0
Filter	<0.48	0.02	0.14
Total weight (mg)		14.74	

Table C-37. PARTICULATE SIZE DISTRIBUTION; SCRUBBER B-1 PRIMARY CRUSHER, SCRUBBER OUTLET (SPRAYS ON)

Run number	1
Date	10/27/79
Test time (min)	124.0
Water vapor %	3.00
Stack temperature °C	12.8
(°F)	(55.0)
Sampling rate m^3/min	0.012
(dscfm)	(0.316)
(acfm)	(0.440)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>14.62	0.00	0
2	14.62 - 9.12	0.14	22.95
3	9.12 - 6.18	0.06	9.84
4	6.18 - 4.21	0.12	19.67
5	4.21 - 2.70	0.01	1.64
6	2.70 - 1.35	0.03	4.92
7	1.35 - 0.83	0.06	9.84
8	0.83 - 0.54	0.03	4.92
Filter	<0.54	0.16	26.23
Total weight (mg)		0.61	

Table C-38. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER B-1 PRIMARY CRUSHER, SCRUBBER OUTLET (SPRAYS ON)

(6 Minute Average)

Type of discharge	stack
Height of discharge point	75 ft
Description of background	sky
Description of sky	clear to overcast
Distance from observer to point	300 ft
Date	8/27/79

	Run 1 test time (0913-1136)	Run 2 test time (1253-1518)	Run 3 test time (1623-1843)
Set no	Average opacity	Average opacity	Average opacity
1	5	8	9
2	5	9	5
3	7	9	5
4	5	9	5
5	5	9	5
6	5	6	8
7	5	5	5
8	5	5	7
9	5	5	5
10	5	5	6
11	5	5	5
12	5	5	7
13	10	10	5
14	5	7	6
15	5	8	5
16	6	5	8
17	5	6	5
18	5	6	6
19	5	5	6
20	5	8	5
21	5	5	5
22	5	5	5
23	5	9	5
24	5	5 (7 min)	5 (2 min)
25	5		

Table C-39. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER B-1 TRANSFER POINT (SPRAYS ON) (6 Minute Average)

Type of discharge	fugitive
Description of sky	N/A
Distance from observer to point	84 in
Date	8/27/79

Set no	Run 1 test time (0915-1115) Average opacity	Run 2 test time (1300-1500) Average opacity	Run 3 test time (1600-1800) Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	0
17	0	0	0
18	0		
19	0		
20	0		

Table C-40. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER B-1 TRANSFER POINT (SPRAYS ON)

Type of discharge	fugitive
Description of sky	N/A
Distance from observer to point	84 in

Test no.	1	2	3	Total
Date	8/27/79	8/27/79	8/27/79	
Test period	0915-1115	1300-1500	1600-1800	
Test duration (sec)	7200	7200	7200	21600
Duration of fugitive emissions (sec)	0	30	0	30
Fugitive emissions (%)	0.0	0.4	0.0	0.14

Table C-41. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER B-1 RAILCAR UNLOADING (SPRAYS ON) (6 Minute Average)

Type of discharge	fugitive
Description of sky	clear
Distance from observer to point	25 ft
Height of observation point	Level 6
Date	8/27/79

	Run 1 test time (0915-1140)	Run 2 test time (1258-1458)
Set no	Average opacity	Average opacity
1	1 (2 mins)	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	
22	0	
23	0	
24	0	
25	0	

Table C-42. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER B-1 RAILCAR UNLOADING (SPRAYS ON)

Type of discharge	fugitive
Description of sky	clear
Distance from observer to point	20 ft
Height of observation point	Level 6

Test no.	1	2	3	Total
Date	8/27/79	8/27/79	8/27/79	
Test period	0915-1140	1258-1458	1621-1821	
Test duration (sec)	8700	7200	7200	23100
Duration of fugitive emissions (sec)	135	87	170	392
Fugitive emissions (%)	1.6	1.2	2.4	1.7

Table C-43. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER B-1 CRUSHER BUILDING (SPRAYS ON)
(6 Minute Average)

Type of discharge	fugitive
Description of sky	clear-cloudy
Distance from observer to point	150 ft
Date	8/27/79

Set no	Run 1 test time (0915-1152) Average opacity	Run 2 test time (1253-1519) Average opacity	Run 3 test time (1623-1844) Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	0
17	0	0	0
18	0	0	0
19	0	0	0
20	0	0	0
21	0	0	0
22	0	0	0
23	0	0	0 (4 mins)
24	0	0	
25	0	0	
26	0		

Table C-44. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER B-1 CRUSHER BUILDING (SPRAYS ON)

Type of discharge			fugitive	
Description of sky			clear-cloudy	
Distance from observer to point			150 ft	
Test no.	1	2	3	Total
Date	8/27/79	8/27/79	8/27/79	
Test period	0915-1152	1253-1519	1623-1844	
Test duration (sec)	9420	8760	8460	26640
Duration of fugitive emissions (sec)	0	0	0	0
Fugitive emissions (%)	0.0	0.0	0.0	0

Table C-45. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER B-2 PEBBLE SCREENING AND MILLING, TOTAL SCRUBBER INLET

Run number		1	2	3	Average
Date		8/29/79	8/29/79	8/30/79	
Test time - minutes		96	96	96	96
*Production rate	Mg/hr	N/A	N/A	N/A	N/A
	(TPH)	N/A	N/A	N/A	N/A
Stack Effluent					
Flow rate	m^3/min	169	159	158	162
	(acfm)	(5981)	(5623)	(5593)	(5732)
Flow rate	DNm^3/min	117	109	111	112
	(dscfm)	(4120)	(3843)	(3916)	(3960)
Temperature	°C	26.4	26.7	23.3	25.5
	(°F)	(79.6)	(80.0)	(74.0)	(77.8)
Water vapor	Vol%	1.4	2.1	0.9	1.5
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.083	0.131	0.198	0.137
(gr/dscf)		(0.036)	(0.057)	(0.087)	(0.060)
g/m^3		0.057	0.089	0.139	0.095
(gr/acf)		(0.025)	(0.039)	(0.061)	(0.042)
kg/hr		0.58	0.85	1.32	0.92
(lb/hr)		(1.28)	(1.88)	(2.90)	(2.02)

*Confidential information.

Table C-46. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER B-2 PEBBLE SCREENING AND MILLING, SCREEN EXHAUST DUCT INLET TO SCRUBBER

Run number		1	2	3	Average
Date		8/29/79	8/29/79	8/30/79	
Test time - minutes		80	80	80	80
*Production rate	Mg/hr	N/A	N/A	N/A	N/A
	(TPH)	N/A	N/A	N/A	N/A
Stack Effluent					
Flow rate	m^3/min	57	52	51	53
	(acfm)	(2014)	(1834)	(1798)	(1882)
Flow rate	DNm^3/min	41	36	36	38
	(dscfm)	(1435)	(1278)	(1273)	(1329)
Temperature	°C	23.4	26.7	21.1	23.7
	(°F)	(74.1)	(80.0)	(70.0)	(74.7)
Water vapor	Vol%	0.0	1.1	1.4	0.8
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.017	0.018	0.019	0.018
(gr/dscf)		(0.007)	(0.008)	(0.008)	(0.008)
g/m^3		0.012	0.012	0.013	0.012
(gr/acf)		(0.005)	(0.005)	(0.006)	(0.005)
kg/hr		0.04	0.04	0.04	0.04
(lb/hr)		(0.09)	(0.08)	(0.09)	(0.09)

*Confidential information.

Table C-47. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER B-2 PEBBLE SCREENING AND MILLING, BUCKET ELEVATOR EXHAUST DUCT INLET TO SCRUBBER

Run number		1	2	3	Average
Date		8/29/79	8/29/79	8/30/79	
Test time - minutes		80	80	80	80
*Production rate	Mg/hr	N/A	N/A	N/A	N/A
	(TPH)	N/A	N/A	N/A	N/A
Stack Effluent					
Flow rate	m^3/min	32	30	29	30
	(acfm)	(1115)	(1022)	(1041)	(1076)
Flow rate	DNm^3/min	23	21	21	21
	(dscfm)	(796)	(741)	(738)	(759)
Temperature	°C	18.7	20.6	18.3	19.2
	(°F)	(65.6)	(69.1)	(65.0)	(66.6)
Water vapor	Vol%	0.7	3.1	1.5	1.8
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.103	0.192	0.144	0.146
(gr/dscf)		(0.045)	(0.084)	(0.063)	(0.064)
g/m^3		0.073	0.133	0.102	0.103
(gr/acf)		(0.032)	(0.058)	(0.045)	(0.045)
kg/hr		0.14	0.24	0.18	0.19
(lb/hr)		(0.31)	(0.53)	(0.40)	(0.41)

*Confidential information.

Table C-48. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER B-2
PEBBLE SCREENING AND MILLING, SCRUBBER OUTLET

Run number		1	2	3	Average
Date		8/29/79	8/29/79	8/30/79	
Test time - minutes		112	112	112	112
*Production rate	Mg/hr	N/A	N/A	N/A	N/A
	(TPH)	N/A	N/A	N/A	N/A
Stack Effluent					
Flow rate	m^3/min	200	229	244	224
	(acfm)	(7055)	(8078)	(8628)	(7921)
Flow rate	DNm^3/min	144	166	177	163
	(dscfm)	(5095)	(5868)	(6258)	(5740)
Temperature	°C	12.8	12.7	10.6	12.0
	(°F)	(55.0)	(54.8)	(51.1)	(53.6)
Water vapor	Vol%	1.9	2.0	2.9	2.3
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.022	0.011	0.013	0.016
(gr/dscf)		(0.010)	(0.005)	(0.006)	(0.007)
g/m^3		0.016	0.008	0.010	0.011
(gr/acf)		(0.007)	(0.004)	(0.004)	(0.005)
kg/hr		0.19	0.11	0.14	0.15
(lb/hr)		(0.42)	(0.25)	(0.31)	(0.33)

*Confidential information.

Table C-49. PARTICULATE SIZE DISTRIBUTION; SCRUBBER B-2 PEBBLE SCREENING AND MILLING, TOTAL SCRUBBER INLET

Run number	1
Date	10/30/80
Test time (min)	60.0
Water vapor %	2.0
Stack temperature °C	21.1
(°F)	(70.0)
Sampling rate m^3/min	0.021
(dscfm)	(0.509)
(acfm)	(0.730)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>11.47	2.60	59.77
2	11.47 - 7.15	0.72	16.55
3	7.15 - 4.83	0.62	14.25
4	4.83 - 3.29	0.01	0.23
5	3.29 - 2.10	0.15	3.45
6	2.10 - 1.04	0.20	4.60
7	1.04 - 0.63	0.05	1.15
8	0.63 - 0.37	0.00	0.00
Filter	<0.37	0.00	0.00
Total Weight (mg)		4.35	

(continued)

Table C-49. (Continued)

Run number	2
Date	10/30/79
Test time (min)	77.00
Water vapor %	2.0
Stack temperature °C	21.1
(°F)	(70.0)
Sampling rate m^3/min	0.021
(dscfm)	(0.509)
(acfm)	(0.730)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>11.47	15.86	76.99
2	11.47 - 7.15	1.09	5.29
3	7.15 - 4.83	1.24	6.02
4	4.83 - 3.29	0.54	2.62
5	3.29 - 2.10	0.89	4.32
6	2.10 - 1.04	0.52	2.52
7	1.04 - 0.63	0.23	1.12
8	0.63 - 0.37	0.14	0.68
Filter	<0.37	0.09	0.44
Total weight (mg)		20.60	

(continued)

Table C-49. (Concluded)

Run number	3
Date	10/30/79
Test time (min)	46.00
Water vapor %	2.0
Stack temperature °C	21.1
(°F)	(70.0)
Sampling rate m^3/min	0.023
(dscfm)	(0.558)
(acfm)	(0.800)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>10.95	1.15	36.16
2	10.95 - 6.82	0.91	28.62
3	6.82 - 4.61	0.18	5.66
4	4.61 - 3.13	0.24	7.55
5	3.13 - 2.00	0.42	13.21
6	2.00 - 0.99	0.24	7.55
7	0.99 - 0.60	0.04	1.26
8	0.60 - 0.35	0.00	0.00
Filter	<0.35	0.00	0.00
Total weight (mg)		3.18	

Table C-50. PARTICULATE SIZE DISTRIBUTION; SCRUBBER B-2 PEBBLE SCREENING AND MILLING, SCREEN EXHAUST DUCT INLET TO SCRUBBER

Run number	1
Date	08/29/79
Test time (min)	60
Water vapor %	2.0
Stack temperature °C	18.3
(°F)	(65.0)
Sampling rate m^3/min	0.020
(dscfm)	(0.504)
(acfm)	(0.710)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>11.59	2.30	13.95
2	11.59 - 7.23	5.01	30.38
3	7.23 - 4.89	2.16	13.10
4	4.89 - 3.32	1.57	9.52
5	3.32 - 2.12	1.45	8.79
6	2.12 - 1.05	1.10	6.67
7	1.05 - 0.64	0.66	4.00
8	0.64 - 0.40	0.46	2.79
Filter	<0.40	1.78	10.79
Total Weight (mg)		16.49	

(continued)

Table C-50. (Continued)

Run number	2
Date	08/29/80
Test time (min)	71.2
Water vapor %	2.0
Stack temperature °C	21.1
(°F)	(70.0)
Sampling rate m^3/min	0.020
(dscfm)	(0.485)
(acfm)	(0.690)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>11.80	5.61	50.31
2	11.80 - 7.36	0.96	8.61
3	7.36 - 4.98	1.37	12.29
4	4.98 - 3.38	1.08	9.69
5	3.38 - 2.16	0.94	8.43
6	2.16 - 1.07	0.46	4.13
7	1.07 - 0.65	0.56	5.02
8	0.65 - 0.41	0.16	1.43
Filter	<0.41	0.01	0.09
Total weight (mg)		11.15	

(continued)

Table C-50. (Concluded)

Run number	3
Date	08/29/79
Test time (min)	60
Water vapor %	2.0
Stack temperature °C	21.1
(°F)	(70.0)
Sampling rate m^3/min	0.022
(dscfm)	(0.535)
(acfm)	(0.760)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>11.24	2.39	42.75
2	11.24 - 7.00	0.66	11.81
3	7.00 - 4.74	0.97	17.35
4	4.74 - 3.22	0.49	8.77
5	3.22 - 2.05	0.57	10.20
6	2.05 - 1.01	0.30	5.37
7	1.01 - 0.61	0.09	1.61
8	0.61 - 0.38	0.08	1.43
Filter	<0.38	0.04	0.72
Total Weight (mg)		5.59	

Table C-51. PARTICULATE SIZE DISTRIBUTION; SCRUBBER B-2 PEBBLE SCREENING AND MILLING, BUCKET ELEVATOR EXHAUST DUCT INLET TO BAGHOUSE

Run number	1
Date	08/29/79
Test time (min)	60
Water vapor %	2.0
Stack temperature °C	21.1
(°F)	(70.0)
Sampling rate m^3/min	0.015
(dscfm)	(0.370)
(acfm)	(0.530)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>13.48	3.25	21.92
2	13.48 - 8.41	2.15	14.50
3	8.41 - 5.69	2.32	15.64
4	5.69 - 3.87	1.42	9.58
5	3.87 - 2.48	1.71	11.53
6	2.48 - 1.23	1.57	10.59
7	1.23 - 0.75	0.84	5.66
8	0.75 - 0.49	0.65	4.38
Filter	<0.49	0.92	6.20
Total Weight (mg)		14.83	

(continued)

Table C-51. (Continued)

Run number	2
Date	08/29/79
Test time (min)	66
Water vapor %	2.0
Stack temperature ^{o}C	21.1
(^{o}F)	(70.0)
Sampling rate m^3/min	0.013
(dscfm)	(0.321)
(acfm)	(0.460)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>14.48	43.74	70.96
2	14.48 - 9.03	2.72	4.41
3	9.03 - 6.12	3.40	5.52
4	6.12 - 4.16	2.93	4.75
5	4.16 - 2.67	2.87	4.66
6	2.67 - 1.33	2.58	4.19
7	1.33 - 0.81	1.32	2.14
8	0.81 - 0.53	0.91	1.48
Filter	<0.53	1.17	1.90
Total Weight (mg)		61.64	

(continued)

Table C-51. (Concluded)

Run number	3
Date	08/29/79
Test time (min)	65
Water vapor %	2.0
Stack temperature ^{o}C	21.1
(^{o}F)	(70.0)
Sampling rate m^{3}/min	0.016
(dscfm)	(0.384)
(acfm)	(0.550)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>13.23	8.50	37.69
2	13.23 - 8.25	2.66	11.80
3	8.25 - 5.59	3.73	16.54
4	5.59 - 3.80	2.15	9.53
5	3.80 - 2.43	2.24	9.93
6	2.43 - 1.21	1.65	7.32
7	1.21 - 0.74	1.03	4.57
8	0.74 - 0.48	0.37	1.64
Filter	<0.48	0.22	0.98
Total Weight (mg)		22.55	

Table C-52. PARTICULATE SIZE DISTRIBUTION; SCRUBBER B-2 PEBBLE SCREENING AND MILLING, SCRUBBER OUTLET

Run number	1
Date	10/30/79
Test time (min)	203.2
Water vapor %	2.0
Stack temperature °C	21.1
(°F)	(70.0)
Sampling rate m^3/min	0.020
(dscfm)	(0.496)
(acfm)	(0.700)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>11.72	0.46	11.56
2	11.72 - 7.30	0.00	0.00
3	7.30 - 4.94	0.50	12.56
4	4.94 - 3.36	0.07	1.76
5	3.36 - 2.15	0.30	7.54
6	2.15 - 1.06	0.65	16.33
7	1.06 - 0.64	0.66	16.58
8	0.64 - 0.43	0.38	9.55
Filter	<0.43	0.96	24.12
Total Weight (mg)		3.98	

Table C-53. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER B-2 PEBBLE SCREENING AND MILLING, SCRUBBER OUTLET
(6 Minute Average)

Type of discharge	stack
Height of discharge point	50 ft
Description of sky	clear to overcast
Distance from observer to point	50 ft
Date	8/29-30/79

Set no	Run 1 test time (1215-1405) Average opacity	Run 2 test time (1643-1726) Average opacity	Run 3 test time (0857-1047) Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	0
17	0	0	0
18	0	0 (4 min)	0
19	0 (2 min)		0 (2 min)

Table C-54. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER B-2 BUCKET ELEVATOR EXHAUST HOOD (6 Minute Average)

Type of discharge	fugitive
Description of sky	N/A
Distance from observer to point	N/A
Date	8/29/79

	Run 1	Run 2	Run 3
	test time (1215-1415)	test time (1545-1705)	test time (0900-1043)
Set no	Average opacity	Average opacity	Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0 (2 mins)	0
15	0		0
16	0		0 (4 mins)
17	0		
18	0		
19	0		
20	0		

Table C-55. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER B-2 BUCKET ELEVATOR EXHAUST HOOD

Type of discharge	fugitive
Description of sky	N/A
Distance from observer to point	N/A

Test no.	1	2	3	Total
Date	8/29/79	8/29/79	8/30/79	
Test period	1215-1415	1545-1705	0857-1047	
Test duration (sec)	7200	4800	6000	18000
Duration of fugitive emissions (sec)	0	0	0	0
Fugitive emissions (%)	0.0	0.0	0.0	0

Table C-56. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER B-2 PEBBLE SCREEN HOOD (6 Minute Average)

Type of discharge	fugitive
Description of sky	cloudy
Distance from observer to point	15 ft
Date	8/29/79

	Run 1 test time (1340-1510)	Run 2 test time (1548-1728)	Run 3 test time (0904-1100)
Set no	Average opacity	Average opacity	Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0 (1 min)	0	0
17		0 (3 mins)	0
18			0
19			0
20			0 (2 mins)

Table C-57. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER B-2 PEBBLE SCREEN HOOD

Type of discharge	fugitive
Description of sky	cloudy
Distance from observer to point	15 ft

Test no.	1	2	3	Total
Date	8/29/79	8/29/79	8/30/79	
Test period	1340-1510	1548-1728	0900-1100	
Test duration (sec)	5400	6000	7200	18600
Duration of fugitive emissions (sec)	0	0	0	0
Fugitive emissions (%)	0.0	0.0	0.0	0

Table C-58. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER B-3 MOLYBDENUM DRYER, TOTAL SCRUBBER INLET

Run number		1	2	3	Average
Date		8/23/79	8/23/79	8/24/79	
Test time - minutes		84	84	84	84
*Production rate	Mg/hr	N/A	N/A	N/A	N/A
	(TPH)	N/A	N/A	N/A	N/A
Stack Effluent					
Flow rate	m^3/min	148	172	156	159
	(acfm)	(5237)	(6062)	(5505)	(5601)
Flow rate	DNm^3/min	74	88	87	83
	(dscfm)	(2611)	(3106)	(3061)	(2926)
Temperature	°C	66.5	65.6	65.8	66.0
	(°F)	(151.8)	(150.0)	(150.4)	(150.7)
Water vapor	Vol%	18.7	16.7	9.8	15.1
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.48	0.38	0.67	0.51
(gr/dscf)		(0.212)	(0.168)	(0.293)	(0.224)
g/m^3		0.24	0.20	0.37	0.27
(gr/acf)		(0.105)	(0.086)	(0.163)	(0.118)
kg/hr		2.15	2.02	3.49	2.55
(lb/hr)		(4.73)	(4.46)	(7.69)	(5.63)

*Confidential information.

Table C-59. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER B-3 MOLYBDENUM DRYER, SCRUBBER OUTLET

Run number		1	2	3	Average
Date		8/23/79	8/23/79	8/24/79	
Test time - minutes		96	96	96	96
*Production rate	Mg/hr	N/A	N/A	N/A	N/A
	(TPH)	N/A	N/A	N/A	N/A
Stack Effluent					
Flow rate	m^3/min	154	164	134	151
	(acfm)	(5433)	(5803)	(4736)	(5324)
Flow rate	DNm^3/min	87	90	85	87
	(dscfm)	(3056)	(3171)	(2988)	(3072)
Temperature	°C	43.1	39.9	33.8	38.9
	(°F)	(109.5)	(103.8)	(92.8)	(102.0)
Water vapor	Vol%	15.6	18.8	8.3	14.2
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.029	0.013	0.017	0.020
(gr/dscf)		(0.013)	(0.006)	(0.007)	(0.009)
g/m^3		0.016	0.007	0.011	0.011
(gr/acf)		(0.007)	(0.003)	(0.005)	(0.005)
kg/hr		0.15	0.07	0.09	0.10
(lb/hr)		(0.33)	(0.16)	(0.19)	(0.22)

*Confidential information.

Table C-60. PARTICULATE SIZE DISTRIBUTION; SCRUBBER B-3 MOLYBDENUM DRYER, TOTAL SCRUBBER INLET

Run number	2
Date	10/23/79
Test time (min)	30.00
Water vapor %	18.0
Stack temperature °C	65.6
(°F)	(150.0)
Sampling rate m^3/min	0.022
(dscfm)	(0.388)
(acfm)	(0.762)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>11.44	7.81	3.79
2	11.44 - 7.12	6.18	3.00
3	7.12 - 4.81	9.10	4.41
4	4.81 - 3.27	19.88	9.64
5	3.27 - 2.08	82.98	40.26
6	2.08 - 1.02	57.24	27.77
7	1.02 - 0.61	9.60	4.66
8	0.61 - 0.28	3.84	1.86
Filter	<0.28	9.49	1.60
Total Weight (mg)		206.1	

(continued)

Table C-60. (Concluded)

Run number	3
Date	10/24/79
Test time (min)	120.0
Water vapor %	28.0
Stack temperature ^{o}C	65.6
(^{o}F)	(150.0)
Sampling rate m^3/min	0.020
(dscfm)	(0.313)
(acfm)	(0.700)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>11.75	25.34	11.65
2	11.75 - 7.32	2.51	1.15
3	7.32 - 4.95	10.12	4.65
4	4.95 - 3.36	13.30	6.12
5	3.36 - 2.14	94.94	43.66
6	2.14 - 1.05	0.00	0.00
7	1.05 - 0.63	55.18	25.38
8	0.63 - 0.29	4.20	1.93
Filter	<0.29	11.84	5.45
Total Weight (mg)		217.4	

Table C-61. PARTICULATE SIZE DISTRIBUTION; SCRUBBER B-3 MOLYBDENUM DRYER, SCRUBBER OUTLET

Run number	1
Date	10/23/79
Test time (min)	60.00
Water vapor %	9.4
Stack temperature °C	40.6
(°F)	(105.0)
Sampling rate m^3/min	0.025
(dscfm)	(0.552)
(acfm)	(0.900)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>10.39	2.35	3.03
2	10.39 - 6.47	2.30	2.96
3	6.47 - 4.37	2.26	2.91
4	4.37 - 2.97	3.66	4.71
5	2.97 - 1.89	19.67	25.33
6	1.89 - 0.93	39.69	51.10
7	0.93 - 0.56	4.36	5.61
8	0.56 - 0.35	3.38	4.35
Filter	<0.35	0.00	0.00
Total Weight (mg)		77.67	

Table C-62. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER B-3 MOLYBDENUM DRYER, SCRUBBER OUTLET (6 Minute Average)

Type of discharge	stack
Height of discharge point	6 ft above roof
Description of sky	overcast-clear
Distance from observer to point	25 ft
Date	8/23-24/79

Set no	Run 2 test time (1320-1459) Average opacity	Run 3 test time (1543-1717) Average opacity	Run 4 test time (0812-0950) Average opacity
1	16	16	16
2	18	12	16
3	19	15	15
4	18	20	14
5	18	20	12
6	15	18	12
7	20	17	10
8	20	19	9
9	17	19	9
10	17	15	7
11	20	15	5
12	16	18	5
13	17	21	5
14	16	19	5
15	15	22	9
16	14	24	10
17	16 (3 mins)		10 (3 mins)

Table C-63. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER B-3
DRYER AREA
(6 Minute Average)

Type of discharge	fugitive
Description of sky	N/A
Distance from observer to point	8 ft
Date	8/23/79

Set no	Run 2 test time (1352-1452) Average opacity	Run 3 test time (1613-1713) Average opacity	Run 4 test time (0806-0906) Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0

Table C-64. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER B-3 DRYER AREA

Type of discharge	fugitive
Description of sky	N/A
Distance from observer to point	8 ft

Test no.	2	3	4	Total
Date	8/23/79	8/23/79	8/24/79	
Test period	1352-1452	1613-1713	0806-0906	
Test duration (sec)	3600	3600	3600	10800
Duration of fugitive emissions (sec)	0	0	0	0
Fugitive emissions (%)	0.0	0.0	0.0	0

Table C-65. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER C-1 CRUSHER SCRUBBER INLET DUCT

Run number		1	2	3	Average
Date		9/27/79	9/27/79	9/27/79	
Test time - minutes		96	96	96	96
Production rate	Mg/hr	311	386	370	356
	(TPH)	(342)	(425)	(407)	(391)
Stack Effluent					
Flow rate	m^3/min	252	264	240	252
	(acfm)	(8890)	(9320)	(8470)	(8893)
Flow rate	DNm^3/min	201	213	195	203
	(dscfm)	(7100)	(7510)	(6870)	(7160)
Temperature	°C	25	22	22	23
	(°F)	(77)	(71)	(71)	(73)
Water vapor	Vol%	1.3	1.6	0.9	1.3
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.027	0.021	0.014	0.021
(gr/dscf)		(0.012)	(0.009)	(0.006)	(0.009)
g/m^3		0.022	0.016	0.011	0.017
(gr/acf)		(0.010)	(0.007)	(0.005)	(0.007)
kg/hr		0.337	0.255	0.155	0.249
(lb/hr)		(0.742)	(0.562)	(0.341)	(0.548)
kg/Mg		0.001	0.0005	0.0005	0.0005
(lb/ton)		(0.002)	(0.001)	(0.001)	(0.001)

Table C-66. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER C-1 CRUSHER TRANSFER POINT EXHAUST, INLET TO SCRUBBER

Run number		1	2	3	Average
Date		9/27/79	9/27/79	9/27/79	
Test time - minutes		96	96	96	96
Production rate	Mg/hr (TPH)	311 (342)	386 (425)	370 (407)	356 (391)
Stack Effluent					
Flow rate	m^3/min (acfm)	37 (1300)	35 (1240)	34 (1200)	35 (1247)
Flow rate	DNm^3/min (dscfm)	30 (1050)	29 (1010)	27 (970)	29 (1010)
Temperature	°C (°F)	24 (76)	22 (71)	19 (67)	22 (71)
Water vapor	Vol%	1.1	1.2	1.8	1.4
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3 (gr/dscf)		0.005 (0.002)	0.007 (0.003)	0.030 (0.013)	0.014 (0.006)
g/m^3 (gr/acf)		0.005 (0.002)	0.007 (0.003)	0.023 (0.010)	0.012 (0.005)
kg/hr (lb/hr)		0.010 (0.021)	0.013 (0.029)	0.049 (0.107)	0.024 (0.052)
kg/Mg (lb/ton)		<0.0001 (0.0001)	<0.0001 (0.0001)	0.0001 (0.0003)	0.0001 (0.0001)

Table C-67. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER C-1 CRUSHER PRESSURE GRIZZLEY EXHAUST DUCT, INLET TO SCRUBBER

Run number		1	2	3	Average
Date		9/27/79	9/27/79	9/27/79	
Test time - minutes		86	96	96	91
Production rate	Mg/hr	311	386	370	356
	(TPH)	(342)	(425)	(407)	(391)
Stack Effluent					
Flow rate	m^3/min	84	91	90	88
	(acfm)	(2960)	(3200)	(3180)	(3113)
Flow rate	DNm^3/min	67	73	73	71
	(dscfm)	(2370)	(2580)	(2590)	(2513)
Temperature	°C	26	24	22	24
	(°F)	(78)	(75)	(72)	(75)
Water vapor	Vol%	1.2	0.7	0.8	0.9
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.018	0.023	0.030	0.023
(gr/dscf)		(0.008)	(0.010)	(0.013)	(0.010)
g/m^3		0.015	0.019	0.025	0.020
(gr/acf)		(0.007)	(0.008)	(0.011)	(0.009)
kg/hr		0.076	0.104	0.135	0.105
(lb/hr)		(0.168)	(0.229)	(0.298)	(0.232)
kg/Mg		0.0002	0.0002	0.0004	0.0003
(lb/ton)		(0.0005)	(0.0005)	(0.0007)	(0.0006)

Table C-68. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER C-1 CRUSHER SCRUBBER OUTLET DUCT

Run number		1	2	3	Average
Date		9/27/79	9/27/79	9/27/79	
Test time - minutes		96	96	96	91
Production rate	Mg/hr (TPH)	311 (342)	386 (425)	370 (407)	356 (391)
Stack Effluent					
*Flow rate	m^3/min (acfm)	496 (17500)	490 (17300)	479 (16900)	488 (17233)
*Flow rate	DNm^3/min (dscfm)	399 (14100)	396 (14000)	391 (13800)	396 (13967)
Temperature	°C (°F)	23 (74)	22 (72)	22 (71)	22 (72)
Water vapor	Vol%	1.5	1.4	1.1	1.3
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3 (gr/dscf)		0.005 (0.002)	0.011 (0.005)	0.009 (0.004)	0.008 (0.004)
g/m^3 (gr/acf)		0.004 (0.002)	0.009 (0.004)	0.007 (0.003)	0.007 (0.003)
*kg/hr (lb/hr)		0.132 (0.290)	0.265 (0.584)	0.202 (0.446)	0.200 (0.440)
*kg/Mg (lb/ton)		0.0004 (0.0008)	0.0007 (0.0014)	0.0006 (0.0011)	0.0006 (0.0011)

*These results subject to revision due to cyclonic flow at the outlet.

Table C-69. PARTICULATE SIZE DISTRIBUTION; SCRUBBER C-1 CRUSHER SCRUBBER INLET DUCT

Run number	1
Date	09/27/79
Test time (min)	60
Water vapor %	1.3
Stack temperature °C	23
(°F)	(73)
Sampling rate m^3/min	0.023
(acfm)	(0.81)
Volume of sample, cf	49.17

Plate no.	Effective Aerodynamic Diameter (EAD) (micrometers)	Weight (milligrams)	Percent per plate
1	11.7	1.0	12.0
2	7.5	0.8	9.6
3	5.0	0.6	7.2
4	3.5	0.5	6.0
5	2.2	0.8	9.6
6	1.1	1.0	12.1
7	0.67	1.0	12.1
8	0.45	1.3	15.7
Filter		1.3	15.7
Total Weight (mg)		8.3	

(continued)

Table C-69. (Continued)

Run number	2
Date	09/28/79
Test time (min)	70
Water vapor %	1.6
Stack temperature °C	23
(°F)	(73)
Sampling rate m^3/min	0.019
(acfm)	(0.69)
Volume of sample, cf	47.84

Plate no.	EAD (micrometers)	Weight (milligrams)	Percent per plate
1	12.7	0.9	10.9
2	8.05	0.3	3.6
3	5.3	0.6	7.2
4	3.75	0.8	9.6
5	2.35	1.1	13.3
6	1.2	1.2	14.5
7	0.74	1.2	14.5
8	0.50	0.8	9.6
Filter		1.4	16.9
Total Weight (mg)		8.3	

(continued)

Table C-69. (Concluded)

Run number	3
Date	09/28/79
Test time (min)	70
Water vapor %	0.9
Stack temperature ^{o}C	23
(^{o}F)	(73)
Sampling rate m^{3}/min	0.019
(acfm)	(0.67)
Volume of sample, cf	46.49

Plate no.	EAD (micrometers)	Weight (milligrams)	Percent per plate
1	12.6	0.9	11.4
2	8.4	0.5	6.3
3	5.45	1.0	12.7
4	3.75	0.7	8.9
5	2.4	1.6	20.3
6	1.2	0.9	11.4
7	0.76	1.0	12.7
8	0.52	0.6	7.6
Filter		0.7	8.9
Total Weight (mg)		7.9	

Table C-70. PARTICULATE SIZE DISTRIBUTION; SCRUBBER C-1 CRUSHER TRANSFER POINT EXHAUST DUCT, INLET TO SCRUBBER

Run number	1
Date	09/28/79
Test time (min)	75
Water vapor %	1.1
Stack temperature °C	22
(°F)	(72)
Sampling rate m^3/min	0.018
(acfm)	(0.62)
Volume of sample, cf	43.65

Plate no.	Effective Aerodynamic Diameter (EAD) (micrometers)	Weight (milligrams)	Percent per plate
1	13.5	0.5	11.9
2	8.55	0.4	9.5
3	5.65	0.5	11.9
4	4.00	0.4	9.5
5	2.50	0.3	7.1
6	1.30	0.6	14.3
7	0.80	0.5	11.9
8	0.54	0.4	9.5
Filter		0.6	14.3
Total Weight (mg)		4.2	

(continued)

Table C-70. (Continued)

Run number	2
Date	09/28/79
Test time (min)	90
Water vapor %	1.2
Stack temperature ^{o}C	22
(^{o}F)	(72)
Sampling rate m^3/min	0.018
(acfm)	(0.63)
Volume of sample, cf	57.87

Plate no.	EAD (micrometers)	Weight (milligrams)	Percent per plate
1	13.2	0.6	10.3
2	8.4	0.8	13.8
3	5.5	0.5	8.6
4	3.8	0.3	5.2
5	2.5	1.2	20.7
6	1.25	1.0	17.2
7	0.78	0.5	8.6
8	1.52	0.6	10.3
Filter		0.3	5.2
Total Weight (mg)		5.8	

(continued)

Table C-70. (Concluded)

Run number	3
Date	09/28/79
Test time (min)	90
Water vapor %	1.8
Stack temperature °C	22
(°F)	(72)
Sampling rate m^3/min	0.018
(acfm)	(0.63)
Volume of sample, cf	56.83

Plate no.	EAD (micrometers)	Weight (milligrams)	Percent per plate
1	13.2	0.7	12.7
2	8.4	0.3	5.5
3	5.5	0.5	9.1
4	3.8	0.7	12.7
5	2.5	1.0	18.2
6	1.25	0.5	9.1
7	0.78	0.5	9.1
8	0.52	0.7	12.7
Filter		0.6	10.9
Total Weight (mg)		5.5	

Table C-71. PARTICULATE SIZE DISTRIBUTION; SCRUBBER C-1
CRUSHER PRESSURE GRIZZLEY
EXHAUST DUCT, INLET TO SCRUBBER

Run number	1
Date	09/28/80
Test time (min)	75
Water vapor %	1.2
Stack temperature ^{o}C	24
(^{o}F)	(75)
Sampling rate m^3/min	0.022
(acfm)	(0.77)
Volume of sample, cf	62.22

Plate no.	Effective Aerodynamic Diameter (EAD) (micrometers)	Weight (milligrams)	Percent per plate
1	12.2	1.1	13.8
2	7.7	0.6	7.5
3	5.3	0.9	11.3
4	3.7	0.5	6.3
5	2.3	1.3	16.3
6	1.2	1.0	12.5
7	0.72	0.9	11.3
8	0.47	0.7	8.8
Filter		1.0	12.5
Total Weight (mg)		8.0	

(continued)

Table C-71. (Continued)

Run number	2
Date	09/28/79
Test time (min)	75
Water vapor %	0.7
Stack temperature °C	24
(°F)	(75)
Sampling rate m^3/min	0.022
(acfm)	(0.77)
Volume of sample, cf	58.14

Plate no.	EAD (micrometers)	Weight (milligrams)	Percent per plate
1	12.2	1.7	22.1
2	7.7	1.2	15.6
3	5.3	0.8	10.4
4	3.7	0.4	5.2
5	2.3	0.7	9.1
6	1.2	0.8	10.4
7	0.72	0.8	10.4
8	0.47	0.6	7.8
Filter		0.7	9.1
Total Weight (mg)		7.7	

(continued)

Table C-71. (Concluded)

Run number	3
Date	09/28/79
Test time (min)	75
Water vapor %	0.8
Stack temperature $^{\circ}C$	24
($^{\circ}F$)	(75)
Sampling rate m^3/min	0.022
(acfm)	(0.76)
Volume of sample, cf	57.41

Plate no.	EAD (micrometers)	Weight (milligrams)	Percent per plate
1	12.4	1.0	13.2
2	7.9	0.5	6.6
3	5.3	0.4	5.3
4	3.7	0.5	6.6
5	2.4	1.2	15.8
6	1.2	1.3	17.1
7	0.73	0.9	11.8
8	0.48	0.8	10.5
Filter		1.0	13.2
Total Weight (mg)		7.6	

Table C-72. PARTICULATE SIZE DISTRIBUTION; SCRUBBER C-1 CRUSHER SCRUBBER OUTLET DUCT

Run number	1
Date	09/27/79
Test time (min)	160
Water vapor %	1.4
Stack temperature °C	18
(°F)	(65)
Sampling rate m^3/min	0.019
(acfm)	(0.68)
Volume of sample, cf	110.48

Plate no.	Effective Aerodynamic Diameter (EAD) (micrometers)	Weight (milligrams)	Percent per plate
1	12.4	0.2	4.2
2	8.0	0.2	4.2
3	5.35	0.3	6.25
4	3.7	0.4	8.3
5	2.4	0.7	14.6
6	1.2	0.6	12.5
7	0.73	0.7	14.6
8	0.50	1.0	20.8
Filter		0.7	14.6
Total Weight (mg)		4.8	

Table C-73. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER C-1 CRUSHER SCRUBBER OUTLET (6 Minute Average)

Type of discharge	stack
Height of discharge point	@120 ft
Description of background	scattered
Description of sky	partly clouldy
Distance from observer to point	@7 ft
Height of observation point	5 ft below lip
Date	9/27/79

	Run 1 test time (1804-1913)
Set no	Average opacity
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0 (3 mins)

Table C-74. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER C-1 CRUSHER TRANSFER POINT AREA (6 Minute Average)

Type of discharge	fugitive
Height of discharge point	@50 ft
Distance from observer to point	@ 50 ft
Height of observation point	5 ft above walk
Date	9/27/79

	Run 1 test time (1740-1938)	Run 2 test time (2100-2242)	Run 3 test time (0000-0138)
Set no	Average opacity	Average opacity	Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	0
17	0	0	0 (2 mins)
18	0		
19	0		
20	0 (4 mins)		

Table C-75. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER C-1 CRUSHER TRANSFER POINT AREA

Type of discharge fugitive
Distance from observer to point 17 ft

Test no.	1	2	3	Total
Date	9/27/79	9/27/79	9/27/79	
Test period	1743-1940	2100-2245	0000-0145	
Test duration (sec)	4800	4800	4800	14400
Duration of fugitive emissions (sec)	0	0	0	0
Fugitive emissions (%)	0	0	0	0

Table C-76. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER C-1 GRIZZLY HOOD AND CRUSHER ENTRANCE, PROCESS HOODS
(6 Minute Average)

Type of discharge	fugitive
Height of discharge point	@12 ft
Description of background	inside building
Distance from observer to point	25 ft
Height of observation point	ground level
Date	9/27/79

	Run 1 test time (1745-1953)	Run 2 test time (2115-2305)	Run 3 test time (0005-0149)
Set no	Average opacity	Average opacity	Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0		0
17	0		0
18	0		0 (3 mins)
19	0		
20	0		
21	0		
22	0 (2 mins)		

Table C-77. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER C-1 GRIZZLY HOOD AND CRUSHER ENTRANCE, PROCESS HOODS

Type of discharge	fugitive
Height of discharge point	@ 12 ft
Description of background	inside building
Distance from observer to point	25 ft
Height of observation point	ground level

Test no.	1	2	3	Total
Date	9/27/79	9/27/79	9/28/79	
Test period	1745-1950	2115-2300	0000-0135	
Test duration (sec)	6000	5400	4800	16200
Duration of fugitive emissions (sec)	0	0	0	0
Fugitive emissions (%)	0	0	0	0

Table C-78. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER C-1 CRUSHER GRIZZLY (6 Minute Average)

Type of discharge	fugitive
Height of discharge point	12 ft
Description of background	inside building
Distance from observer to point	25 ft
Height of observation point	ground level
Date	9/27/79

Set no	Run 1 test time (1751-1907) Average opacity	Run 2 test time (2116-2258) Average opacity	Run 3 test time (0002-0138) Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0 (2 mins)	0	0
16		0	0

Table C-79. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER C-1 CRUSHER GRIZZLY

Type of discharge	fugitive
Height of discharge point	12 ft
Description of background	inside building
Distance from observer to point	25 ft
Height of observation point	ground level

Test no.	1	2	3	Total
Date		9/27/79	9/27-28/79	
Test period	N/A	2115-2300	0005-0145	
Test duration (sec)		5100	4800	9900
Duration of fugitive emissions (sec)		0	0	0
Fugitive emissions (%)		0	0	0

Table C-80. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER C-2
FINE ORE BINS SCRUBBER INLET DUCT

Run number		1	2	3	Average
Date		9/28/79	9/28/79	9/28/79	
Test time - minutes		64	64	64	64
Production rate	Mg/hr	341	374	371	362
	(TPH)	(375)	(412)	(408)	(398)
Stack Effluent					
Flow rate	m^3/min	66	67	66	66
	(acfm)	(2320)	(2360)	(2320)	(2333)
Flow rate	DNm^3/min	52	54	53	53
	(dscfm)	(1850)	(1910)	(1880)	(1880)
Temperature	°C	22	18	16	19
	(°F)	(72)	(64)	(61)	(66)
Water vapor	Vol%	1.0	0.9	1.0	1.0
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.014	0.007	0.009	0.010
(gr/dscf)		(0.006)	(0.003)	(0.004)	(0.004)
g/m^3		0.010	0.006	0.007	0.007
(gr/acf)		(0.004)	(0.003)	(0.003)	(0.003)
kg/hr		0.040	0.026	0.029	0.032
(lb/hr)		(0.089)	(0.057)	(0.065)	(0.070)
kg/Mg		0.0002	0.0005	0.0001	0.0001
(lb/ton)		(0.0004)	(0.0001)	(0.0002)	(0.0002)

Table C-81. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER C-2 FINE ORE BINS HOPPER EXHAUST DUCT

Run number		1	2	3	Average
Date		9/28/79	9/28/79	9/28/79	
Test time - minutes		64	64	64	64
Production rate	Mg/hr	341	374	371	362
	(TPH)	(375)	(412)	(408)	(398)
Stack Effluent					
Flow rate	m^3/min	12	12	11	12
	(acfm)	(440)	(430)	(400)	(423)
Flow rate	DNm^3/min	10	10	9	10
	(dscfm)	(350)	(350)	(330)	(343)
Temperature	°C	21	19	18	19
	(°F)	(70)	(66)	(64)	(67)
Water vapor	Vol%	1.7	1.1	0.9	1.2
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.007	0.007	0.007	0.007
(gr/dscf)		(0.003)	(0.003)	(0.003)	(0.003)
g/m^3		0.007	0.005	0.005	0.006
(gr/acf)		(0.003)	(0.002)	(0.002)	(0.002)
kg/hr		0.005	0.004	0.004	0.004
(lb/hr)		(0.010)	(0.008)	(0.008)	(0.009)
kg/Mg		0.00002	0.00001	0.00001	0.00001
(lb/ton)		(0.00004)	(0.00002)	(0.00002)	(0.00003)

Table C-82. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER C-2 FINE ORE BINS SCRUBBER OUTLET DUCT

Run number		1	2	3	Average
Date		9/28/79	9/28/79	9/28/79	
Test time - minutes		64	64	64	64
Production rate	Mg/hr	341	374	371	362
	(TPH)	(375)	(412)	(408)	(398)
Stack Effluent					
Flow rate	m^3/min	85	87	78	83
	(acfm)	(2990)	(3060)	(2770)	(2940)
Flow rate	DNm^3/min	69	72	65	69
	(dscfm)	(2450)	(2530)	(2300)	(2427)
Temperature	°C	21	18	17	19
	(°F)	(69)	(64)	(63)	(65)
Water vapor	Vol%	1.3	1.2	1.1	1.2
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.007	0.005	0.005	0.005
(gr/dscf)		(0.003)	(0.002)	(0.002)	(0.002)
g/m^3		0.005	0.005	0.005	0.005
(gr/acf)		(0.002)	(0.002)	(0.002)	(0.002)
kg/hr		0.025	0.024	0.022	0.023
(lb/hr)		(0.056)	(0.054)	(0.048)	(0.053)
kg/Mg		0.0001	0.0005	0.0005	0.0004
(lb/ton)		(0.0002)	(0.0001)	(0.0001)	(0.0001)

Table C-83. PARTICULATE SIZE DISTRIBUTION; SCRUBBER C-2 FINE ORE BINS SCRUBBER INLET DUCT

Run number	1
Date	09/28/79
Test time (min)	90
Water vapor %	1.0
Stack temperature ^{o}C	19
(^{o}F)	(66)
Sampling rate m^3/min	0.023
(acfm)	(0.80)
Volume of sample, cf	71.78

Plate no.	Effective Aerodynamic Diameter (EAD) (micrometers)	Weight (milligrams)	Percent per plate
1	11.8	0.6	4.4
2	7.4	2.0	14.7
3	4.9	3.5	25.7
4	3.5	1.1	8.1
5	2.2	1.7	12.5
6	1.1	2.0	14.7
7	0.67	1.1	8.1
8	0.46	0.9	6.6
Filter		0.7	5.1
Total Weight (mg)		13.6	

(continued)

Table C-83. (Continued)

Run number	2
Date	09/30/79
Test time (min)	90
Water vapor %	0.9
Stack temperature °C	19
(°F)	(66)
Sampling rate m^3/min	0.017
(acfm)	(0.60)
Volume of sample, cf	72.82

Plate no.	EAD (micrometers)	Weight (milligrams)	Percent per plate
1	11.8	0.4	9.5
2	7.4	0.2	4.8
3	4.9	0.5	11.9
4	3.5	0.7	16.7
5	2.2	0.8	19.0
6	1.1	0.5	11.9
7	0.67	0.5	11.9
8	0.46	0.4	9.5
Filter		0.2	4.8
Total Weight (mg)		4.2	

(continued)

Table C-83. (Concluded)

Run number	3
Date	09/30/79
Test time (min)	85
Water vapor %	1.0
Stack temperature °C	19
(°F)	(66)
Sampling rate m^3/min	0.023
(acfm)	(0.81)
Volume of sample, cf	68.54

Plate no.	EAD (micrometers)	Weight (milligrams)	Percent per plate
1	11.8	0.9	13.2
2	7.4	0.6	8.8
3	4.9	1.0	14.7
4	3.5	0.3	4.4
5	2.2	1.5	22.1
6	1.1	0.7	10.3
7	0.67	0.7	10.3
8	0.46	0.6	8.8
Filter		0.5	7.4
Total Weight (mg)		6.8	

Table C-84. PARTICULATE SIZE DISTRIBUTION; SCRUBBER C-2 FINE ORE BINS HOPPER EXHAUST DUCT

Run number	1
Date	09/29/79
Test time (min)	75
Water vapor %	1.7
Stack temperature °C	19
(°F)	(66)
Sampling rate m^3/min	0.022
(acfm)	(0.77)
Volume of sample, cf	59.88

Plate no.	Effective Aerodynamic Diameter (EAD) (micrometers)	Weight (milligrams)	Percent per plate
1	12.0	0.2	3.9
2	7.5	0.3	5.9
3	5.0	0.4	7.8
4	3.6	0.7	13.7
5	2.2	1.0	19.6
6	1.1	0.8	15.7
7	0.7	0.7	13.7
8	0.45	0.5	9.8
Filter		0.5	9.8
Total Weight (mg)		5.1	

(continued)

Table C-84. (Continued)

Run number	2
Date	10/01/79
Test time (min)	75
Water vapor %	1.1
Stack temperature °C	19
(°F)	(66)
Sampling rate m^3/min	0.021
(acfm)	(0.75)
Volume of sample, cf	59.78

Plate no.	EAD (micrometers)	Weight (milligrams)	Percent per plate
1	12.1	0.2	5.7
2	7.6	0.1	2.9
3	5.1	0.3	8.6
4	3.6	0.4	11.4
5	2.3	0.4	11.4
6	1.2	0.7	20.0
7	0.7	0.6	17.1
8	0.45	0.5	14.3
Filter		0.3	8.6
Total Weight (mg)		3.5	

(continued)

Table C-84. (Concluded)

Run number	3
Date	10/01/79
Test time (min)	85
Water vapor %	0.9
Stack temperature °C	
(°F)	(66)
Sampling rate m^3/min	0.022
(acfm)	(0.76)
Volume of sample, cf	66.55

Plate no.	EAD (micrometers)	Weight (milligrams)	Percent per plate
1	12.0	0.2	4.2
2	7.5	0.1	2.8
3	5.0	0.4	8.3
4	3.6	0.7	14.6
5	2.2	0.9	18.8
6	1.1	1.1	22.9
7	0.7	0.7	14.6
8	0.45	0.5	10.4
Filter		0.2	4.2
Total Weight (mg)		4.8	

Table C-85. PARTICULATE SIZE DISTRIBUTION; SCRUBBER C-2 FINE ORE BINS SCRUBBER OUTLET DUCT

Run number	1
Date	09/28/79
Test time (min)	90
Water vapor %	1.2
Stack temperature ^{0}C	18
(^{0}F)	(65)
Sampling rate m^3/min	0.024
(acfm)	(0.83)
Volume of sample, cf	79.80

Plate no.	Effective Aerodynamic Diameter (EAD) (micrometers)	Weight (milligrams)	Percent per plate
1	11.4	0.1	2.9
2	7.1	0.1	2.9
3	4.8	0.2	5.9
4	3.4	0.3	8.8
5	2.1	0.4	11.8
6	1.1	0.7	20.6
7	0.65	0.8	23.5
8	0.45	0.5	14.7
Filter		0.3	8.8
Total Weight (mg)		3.4	

Table C-86. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER C-2 FINE ORE BINS TRANSFER POINT, SCRUBBER INLET (6 Minute Average)

Type of discharge	fugitive
Height of discharge point	8 ft
Distance from observer to point	25 ft
Date	9/28/79

Set no	Run 1 test time (1850-2005) Average opacity	Run 2 test time (2125-2240) Average opacity	Run 3 test time (2330-0020) Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0 (2 mins)
10	0	0	
11	0	0	
12	0	0	
13	0 (3 mins)	0 (3 mins)	

Table C-87. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER C-2 FINE ORE BINS, SCRUBBER OUTLET (6 Minute Average)

Type of discharge	stack
Height of discharge point	170 ft
Description of sky	clear
Distance from observer to point	@35 ft
Height of observation point	150 ft
Date	9/28/79

Set no	Run 1 test time (1845-1945) Average opacity
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0

Table C-88. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER C-2 FINE ORE BIN HOPPER EXHAUST, PROCESS AREA (6 Minute Average)

Type of discharge	fugitive
Height of observation point	eye level
Date	9/28/79

Set no	Run 1 test time (1848-2010) Average opacity	Run 2 test time (2120-2200) Average opacity	Run 3 test time (2325-0030) Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0 (4 mins)	0
8	0		0
9	0		0
10	0		0
11	0		0 (5 mins)
12	0		
13	0 (5 mins)		

Table C-89. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER C-2
FINE ORE BIN HOPPER EXHAUST, PROCESS AREA

Type of discharge	fugitive
Height of observation point	eye level

Test no.	1	2	3	Total
Date	9/28/79	9/28/79	9/28/79	
Test period	0650-0810	0923-0958	1126-1231	
Test duration (sec)	4800	2100	3900	10800
Duration of fugitive emissions (sec)	0	0	0	0
Fugitive emissions (%)	0	0	0	0

Table C-90. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER C-3* PACKAGING AREA EXHAUST DUCT (SCRUBBER OUTLET)

Run number		1	2	3	Average
Date		10/01/79	10/01/79	10/01/79	
Test time - minutes		64	64	64	64
Stack Effluent					
Flow rate	m^3/min	33	32	33	33
	(acfm)	(1180)	(1120)	(1160)	(1153)
Flow rate	DNm^3/min	25	24	24	24
	(dscfm)	(890)	(830)	(860)	(860)
Temperature	°C	37	41	49	42
	(°F)	(98)	(105)	(120)	(108)
Water vapor	Vol%	1.6	2.0	1.5	1.7
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.016	0.007	0.007	0.010
(gr/dscf)		(0.007)	(0.003)	(0.003)	(0.004)
g/m^3		0.011	0.006	0.005	0.007
(gr/acf)		(0.005)	(0.003)	(0.002)	(0.003)
kg/hr		0.023	0.011	0.010	0.015
(lb/hr)		(0.050)	(0.025)	(0.023)	(0.033)

*Scrubber C-3 is subsequently ducted to scrubber C-4.

Table C-91. PARTICULATE SIZE DISTRIBUTION; SCRUBBER C-3* PACKAGING AREA EXHAUST DUCT (SCRUBBER OUTLET)

Run number	1
Date	10/01/79
Test time (min)	55
Water vapor %	1.6
Stack temperature °C	40
(°F)	(104)
Sampling rate m^3/min	0.029
(acfm)	(1.01)
Volume of sample, cf	54.88

Plate no.	Effective Aerodynamic Diameter (EAD) (micrometers)	Weight (milligrams)	Percent per plate
1	11.4	1.3	11.7
2	7.0	1.6	14.4
3	4.7	1.0	9.0
4	3.3	1.0	9.0
5	2.0	1.9	17.1
6	0.99	2.1	18.9
7	0.65	1.0	9.0
8	0.44	0.9	8.1
Filter		0.3	2.7
Total Weight (mg)		11.1	

(continued)

Table C-91. (Continued)

Run number	2
Date	10/01/79
Test time (min)	55
Water vapor %	2.0
Stack temperature ^oC	40
(^oF)	(104)
Sampling rate m^3/min	0.027
(acfm)	(0.96)
Volume of sample, cf	50.77

Plate no.	EAD (micrometers)	Weight (milligrams)	Percent per plate
1	11.5	1.6	13.2
2	7.2	1.6	13.2
3	4.8	0.8	6.6
4	3.4	1.0	8.3
5	2.2	2.0	16.5
6	1.1	1.4	11.6
7	0.67	1.4	11.6
8	0.45	0.8	6.6
Filter		1.5	12.4
Total Weight (mg)		12.1	

(continued)

Table C-91. (Concluded)

Run number	3
Date	10/01/79
Test time (min)	55
Water vapor %	1.5
Stack temperature ^{o}C	40
(^{o}F)	(104)
Sampling rate m^3/min	0.027
(acfm)	(0.96)
Volume of sample, cf	51.89

Plate no.	EAD (micrometers)	Weight (milligrams)	Percent per plate
1	11.5	1.0	9.7
2	7.2	0.8	7.8
3	4.8	1.0	9.7
4	3.4	1.3	12.6
5	2.2	1.6	15.5
6	1.1	1.3	12.6
7	0.67	1.2	11.7
8	0.45	1.0	9.7
Filter		1.1	10.7
Total Weight (mg)		10.3	

[*] Scrubber C-3 is subsequently ducted to scrubber C-4.

Table C-92. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER C-3*
PACKAGING AREA (BARRELLING ENCLOSURE)
(6 Minute Average)

Type of discharge	fugitive
Description of sky	Indoors
Distance from observer to point	15 ft
Height of observation point	eye level
Date	10/01/79

	Run 1 test time (0930-1034)	Run 2 test time (1230-1333)	Run 3 test time (1435-1535)
Set no	Average opacity	Average opacity	Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0 (4 mins)
8	0	0	
9	0	0	
10	0 (5 mins)	0 (4 mins)	

---

[*] Scrubber C-3 is subsequently ducted to scrubber C-4.

Table C-93. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER C-3* BARRELING ENCLOSURE AREA (BARRELING ENCLOSURE)

Type of discharge		fugitive		
Test no.	1	2	3	Total
Date	10/01/79	10/01/79	10/01/79	
Test period	0930-1040	1230-1335	1435-1540	
Test duration (sec)	4200	4500	3900	12600
Duration of fugitive emissions (sec)	0	0	0	0
Fugitive emissions (%)	0	0	0	0

---

[*] Scrubber C-3 is subsequently ducted to scrubber C-4.

Table C-94. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER C-4 DRYER SCRUBBER INLET DUCT

Run number		1	2	3	Average
Date		10/01/79	10/01/79	10/01/79	
Test time - minutes		64	64	64	64
Stack Effluent					
Flow rate	m^3/min	53	58	49	53
	(acfm)	(1860)	(2040)	(1730)	(1877)
Flow rate	DNm^3/min	16	16	16	16
	(dscfm)	(580)	(550)	(560)	(563)
Temperature	°C	300	313	313	309
	(°F)	(572)	(595)	(595)	(587)
Water vapor	Vol%	24.2	32.6	18.7	25.1
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		5.782	7.630	2.059	5.157
(gr/dscf)		(2.527)	(3.335)	(0.900)	(2.254)
g/m^3		1.798	2.061	0.671	1.510
(gr/acf)		(0.786)	(0.901)	(0.293)	(0.660)
kg/hr		5.68	7.14	1.97	4.93
(lb/hr)		(12.53)	(15.75)	(4.35)	(10.88)

Table C-95. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER C-4 DRYER SCRUBBER OUTLET DUCT

Run number		1	2	3	Average
Date		10/01/79	10/01/79	10/01/79	
Test time - minutes		64	64	64	64
Stack Effluent					
Flow rate	m^3/min (acfm)	117 (4140)	110 (3870)	115 (4060)	114 (4023)
Flow rate	DNm^3/min (dscfm)	74 (2620)	66 (2340)	75 (2640)	72 (2533)
Temperature	°C (°F)	55 (131)	58 (137)	52 (125)	55 (131)
Water vapor	Vol%	12.1	14.8	10.3	12.4
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3 (gr/dscf)		0.286 (0.125)	0.117 (0.051)	0.062 (0.027)	0.156 (0.068)
g/m^3 (gr/acf)		0.181 (0.079)	0.070 (0.031)	0.040 (0.018)	0.121 (0.053)
kg/hr (lb/hr)		1.27 (2.81)	0.46 (1.02)	0.28 (0.61)	0.67 (1.48)

Table C-96. PARTICULATE SIZE DISTRIBUTION; SCRUBBER C-4 DRYER SCRUBBER INLET DUCT

Run number	1
Date	10/01/79
Test time (min)	2
Water vapor %	24.2
Stack temperature °C	308
(°F)	(587)
Sampling rate m^3/min	0.067
(acfm)	(2.35)

Plate no.	Effective Aerodynamic Diameter (EAD) (micrometers)	Weight (milligrams)	Percent per plate
1	12.6	30.6	30.5
2	8.1	22.1	22.1
3	5.5	14.1	14.1
4	3.7	12.6	12.6
5	2.4	9.4	9.4
6	1.2	2.3	2.3
7	0.72	3.5	3.5
8	0.49	2.6	2.6
Filter		3.0	3.0
Total Weight (mg)		100.2	

(continued)

Table C-96. (Continued)

Run number	2
Date	10/01/79
Test time (min)	2
Water vapor %	32.6
Stack temperature °C	308
(°F)	(587)
Sampling rate m^3/min	0.069
(acfm)	(2.44)

Plate no.	EAD (micrometers)	Weight (milligrams)	Percent per plate
1	12.4	24.8	25.9
2	8.0	26.3	27.5
3	5.4	13.0	13.6
4	3.6	12.9	13.5
5	2.3	7.9	8.3
6	1.2	3.4	3.7
7	0.71	2.3	2.4
8	0.48	2.0	2.1
Filter		2.9	3.0
Total Weight (mg)		95.5	

(continued)

Table C-96. (Concluded)

Run number	3
Date	10/01/79
Test time (min)	1.5
Water vapor %	18.7
Stack temperature °C	308
(°F)	(587)
Sampling rate m^3/min	0.058
(acfm)	(2.04)

Plate no.	EAD (micrometers)	Weight (milligrams)	Percent per plate
1	13.9	29.3	32.7
2	8.5	24.7	27.6
3	5.7	13.2	14.7
4	3.9	9.2	10.3
5	2.5	5.9	6.6
6	1.3	2.3	2.6
7	0.77	1.7	1.9
8	0.52	1.2	1.3
Filter		2.0	2.2
Total Weight (mg)		89.5	

Table C-97. PARTICULATE SIZE DISTRIBUTION; SCRUBBER C-4 DRYER SCRUBBER OUTLET DUCT

Run number	1
Date	10/01/79
Test time (min)	4.0
Water vapor %	12.1
Stack temperature °C	54
(°F)	(130)
Sampling rate m^3/min	0.023
(acfm)	(0.81)

Plate no.	Effective Aerodynamic Diameter (EAD) (micrometers)	Weight (milligrams)	Percent per plate
1	12.8	1.1	21.6
2	8.2	0.7	13.7
3	5.4	0.3	5.9
4	3.9	0.2	3.9
5	2.3	0.4	7.8
6	1.2	0.8	15.7
7	0.74	0.5	9.8
8	0.50	0.3	5.9
Filter		0.8	15.7
Total Weight (mg)		5.1	

Table C-98. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER C-4 DRYER SCRUBBER OUTLET DUCT (6 Minute Average)

Type of discharge	stack
Height of discharge point	@ 80 ft
Description of sky	clear
Distance from observer to point	@150 ft
Height of observation point	@65 ft
Date	10/01/79

	Run 1 test time (930-1034)	Run 2 test time (1230-1341)	Run 3 test time (1430-1535)
Set no	Average opacity	Average opacity	Average opacity
1	3	5	0
2	2	4	0
3	0	5	0
4	0	4	0
5	0	4	0
6	0	5	0
7	0	3	0
8	0	3	0
9	0	4	0
10	0	4	0
11	0 (4 mins)	3	0 (5 mins)
12		2 (5 mins)	

Table C-99. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER D-1 DRYER CYCLONE INLET, NORTH

Run number		4	5	6	7	Average
Date		12/6/79	12/7/79	12/8/79	12/8/79	
Test time - minutes		82	22	30	32	
Stack Effluent						
Flow rate	m^3/min (acfm)	833 (29420)	596 (21060)	628 (22160)	800 (28240)	714 (25220)
Flow rate	DNm^3/min (dscfm)	414 (14630)	320 (11300)	318 (11220)	387 (13680)	360 (12708)
Temperature	°C (°F)	147 (297)	101 (214)	156 (313)	171 (340)	144 (291)
Water vapor	Vol%	27.6	31.0	26.5	27.1	28.1
Particulate Emissions						
Probe and Filter Catch						
g/DNm^3 (gr/dscf)		119.00 (52.01)	199.58 (87.23)	227.98 (99.64)	163.68 (71.54)	177.56 (77.61)
g/m^3 gr/acf)		59.17 (25.86)	107.10 (46.81)	115.41 (50.44)	79.30 (34.66)	90.24 (39.44)
kg/hr (lb/hr)		2957 (6520)	3833 (8450)	4345 (9580)	3806 (8390)	3735 (8235)

Table C-100. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER D-1 DRYER CYCLONE INLET, SOUTH

Run number		4	5	6	7	Average
Date		12/6/79	12/7/79	12/8/79	12/8/79	
Test time - minutes		40	24	32	32	
Stack Effluent						
Flow rate	m^3/min	645	716	753	792	726
	(acfm)	(22780)	(25270)	(26580)	(27980)	(25653)
Flow rate	DNm^3/min	359	410	342	416	382
	(dscfm)	(12680)	(14470)	(12090)	(14690)	(13483)
Temperature	°C	140	94	204	109	137
	(°F)	(284)	(201)	(399)	(228)	(278)
Water vapor	Vol%	20.3	27.7	26.5	32.0	26.63
Particulate Emissions						
Probe and Filter Catch						
g/DNm^3		88.68	190.93	86.07	142.75	127.11
(gr/dscf)		(38.76)	(83.45)	(37.62)	(62.39)	(55.56)
g/m^3		49.33	109.33	39.17	74.99	68.20
gr/acf)		(21.56)	(47.78)	(17.12)	(32.77)	(29.81)
kg/hr		1910	4695	1769	3565	2985
(lb/hr)		(4210)	(10350)	(3900)	(7860)	(6580)

Table C-101. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER D-1 DRYER SCRUBBER INLET, NORTH

Run number		4	5	6	7	Average
Date		12/06/79	12/07/79	12/08/79	12/08/79	
Test time - minutes		40	20.9	32	32	
Stack Effluent						
Flow rate	m^3/min	837	681	720	722	740
	(acfm)	(29560)	(24060)	(25440)	(25510)	(26143)
Flow rate	DNm^3/min	427	401	415	410	413
	(dscfm)	(15090)	(14170)	(14660)	(14470)	(14598)
Temperature	°C	161	96	110	110	119
	(°F)	(321)	(205)	(229)	(229)	(246)
Water vapor	Vol%	23.1	25.0	25.2	26.3	24.9
Particulate Emissions						
Probe and Filter Catch						
g/DNm^3		18.354	13.236	14.840	24.713	17.786
(gr/dscf)		(8.022)	(5.785)	(6.486)	(10.801)	(7.774)
g/m^3		9.391	7.799	8.552	14.022	9.941
(gr/acf)		(4.105)	(3.409)	(3.738)	(6.128)	(4.345)
kg/hr		472	319	370	608	442
(lb/hr)		(1040)	(703)	(815)	(1340)	(975)

Table C-102. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER D-1 DRYER SCRUBBER INLET, SOUTH

Run number		4	5	6	7	Average
Date		12/06/79	12/07/79	12/08/79	12/08/79	
Test time - minutes		34	64	32	32	40.5
Stack Effluent						
Flow rate	m^3/min	757	786	1020	873	859
	(acfm)	(26730)	(27760)	(36010)	(30810)	(30328)
Flow rate	DNm^3/min	406	434	559	433	458
	(dscfm)	(14320)	(15330)	(19730)	(15300)	(16170)
Temperature	°C	142	102	186	149	144
	(°F)	(288)	(215)	(366)	(299)	(292)
Water vapor	Vol%	22.7	28.5	14.7	28.8	23.7
Particulate Emissions						
Probe and Filter Catch						
g/DNm^3		25.1	21.2	13.7	47.3	26.8
(gr/dscf)		(10.99)	(9.28)	(5.98)	(20.69)	(11.74)
g/m^3		13.48	11.73	7.49	23.48	14.04
(gr/acf)		(5.89)	(5.13)	(3.27)	(10.26)	(6.14)
kg/hr		612	553	458	1229	713
(lb/hr)		(1350)	(1220)	(1010)	(2710)	(1573)

Table C-103. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER D-1 DRYER SCRUBBER OUTLET

Run number		4	5	6	Average
Date		12/06/79	12/07/79	12/08/79	
Test time - minutes		96	96	96	96
Stack Effluent					
Flow rate	m^3/min	1819	1561	1745	1709
	(acfm)	(64240)	(55130)	(61630)	(60333)
Flow rate	DNm^3/min	1155	981	1152	1096
	(dscfm)	(40800)	(34650)	(40680)	(38710)
Temperature	°C	71	71	70	71
	(°F)	159	159	157	159
Water vapor	Vol%	24.6	25.8	23.6	24.7
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.121	0.043	0.101	0.088
(gr/dscf)		(0.053)	(0.019)	(0.044)	(0.039)
g/m^3		0.076	0.027	0.067	0.057
(gr/acf)		(0.033)	(0.012)	(0.029)	(0.025)
kg/hr		8.3	2.5	7.0	6.0
(lb/hr)		(18.4)	(5.6)	(15.4)	(13.1)

Table C-104. PARTICULATE SIZE DISTRIBUTION; SCRUBBER D-1 DRYER CYCLONE INLET, NORTH

Run number	4
Date	12/6/79
Test time (min)	0.67
Water vapor %	27.6
Stack temperature °C	147
(°F)	(297)
Sampling rate m^3/min	0.029
(acfm)	(1.03)
Volume of sample, cf	0.491

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>10.85	475.45	60.39
2	10.85 - 6.92	156.10	19.82
3	6.92 - 4.55	110.90	14.08
4	4.55 - 3.14	28.55	3.62
5	3.14 - 2.01	13.15	1.67
6	2.01 - 1.02	1.85	0.23
7	1.02 - 0.61	0.50	0.06
8	0.61 - 0.41	0.25	0.03
Filter	<0.41	0.50	0.06
Total weight (mg)		787.25	

(continued)

Table C-104. (Continued)

Run number	5
Date	12/6/79
Test time (min)	0.59
Water vapor %	27.6
Stack temperature °C	147
(°F)	(297)
Sampling rate m^3/min	0.031
(acfm)	(1.10)
Volume of sample, cf	0.46

Plate no.	Diameter (micromeTers)	Weight (milligrams)	Percent per plate
1	>10.48	386.45	42.63
2	10.48 - 6.69	219.65	24.23
3	6.69 - 4.40	203.90	22.49
4	4.40 - 3.04	59.80	6.59
5	3.04 - 1.94	20.60	2.27
6	1.94 - 0.99	6.20	0.68
7	0.99 - 0.59	1.40	0.15
8	0.59 - 0.39	3.00	0.33
Filter	<0.39	5.50	0.60
Total weight (mg)		906.50	

(continued)

Table C-104. (Concluded)

Run number	6
Date	12/6/79
Test time (min)	0.50
Water vapor %	27.6
Stack temperature °C	147
(°F)	(297)
Sampling rate m^3/min	0.037
(acfm)	(1.31)
Volume of sample, cf	0.47

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>9.57	249.35	36.82
2	9.57 - 6.13	180.00	26.58
3	6.13 - 4.02	130.95	19.34
4	4.02 - 2.78	69.70	10.29
5	2.78 - 1.78	35.00	5.16
6	1.78 - 0.90	8.00	1.18
7	0.90 - 0.54	0.55	0.08
8	0.54 - 0.35	1.00	0.14
Filter	<0.35	2.50	0.36
Total weight (mg)		677.05	

Table C-105. PARTICULATE SIZE DISTRIBUTION; SCRUBBER D-1 DRYER CYCLONE INLET, SOUTH

Run number	4
Date	12/6/79
Test time (min)	0.26
Water vapor %	20.3
Stack temperature °C	140
(°F)	(284)
Sampling rate m^3/min	0.018
(acfm)	(0.64)
Volume of sample, cf	0.13

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>13.73	259.10	96.31
2	13.73 - 8.68	6.20	2.30
3	8.68 - 5.74	2.00	0.74
4	5.74 - 3.97	0.70	0.26
5	3.97 - 2.53	0.40	0.14
6	2.53 - 1.30	0.40	0.14
7	1.30 - 0.78	0.00	0.00
8	0.78 - 0.53	0.00	0.00
Filter	<0.53	0.20	0.07
Total weight (mg)		269.00	

(continued)

Table C-105. (Continued)

Run number	5
Date	12/6/79
Test time (min)	0.26
Water vapor %	27.7
Stack temperature °C	140
(°F)	(284)
Sampling rate m^3/min	0.024
(acfm)	(0.85)
Volume of sample, cf	0.156

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>11.91	163.30	97.02
2	11.91 - 7.57	2.30	1.36
3	7.57 - 4.99	0.75	0.44
4	4.99 - 3.45	0.40	0.23
5	3.45 - 2.20	0.30	0.17
6	2.20 - 1.12	0.50	0.29
7	1.12 - 0.68	0.40	0.23
8	0.68 - 0.45	0.15	0.08
Filter	<0.45	0.20	0.11
Total weight (mg)		168.30	

(continued)

Table C-105. (Concluded)

Run number	6
Date	12/6/79
Test time (min)	0.26
Water vapor %	26.5
Stack temperature °C	204
(°F)	(399)
Sampling rate m^3/min	0.018
(acfm)	(0.65)
Volume of sample, cf	0.119

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>14.44	221.00	98.81
2	14.44 - 9.14	0.80	0.35
3	9.14 - 6.04	0.45	0.20
4	6.04 - 4.18	0.30	0.13
5	4.18 - 2.67	0.15	0.06
6	2.67 - 1.37	0.20	0.08
7	1.37 - 0.83	0.35	0.15
8	0.83 - 0.56	0.20	0.08
Filter	<0.56	0.20	0.08
Total weight (mg)		223.65	

Table C-106. PARTICULATE SIZE DISTRIBUTION; SCRUBBER D-1 DRYER SCRUBBER INLET, NORTH

Run number	4
Date	12/08/79
Test time (min)	.50
Water vapor %	25.2
Stack temperature °C	161
(°F)	(321)
Sampling rate m^3/min	0.033
(acfm)	(1.18)
Volume of sample, cf	0.429

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	≥ 10.25	210.60	68.08
2	10.25 - 6.55	40.50	13.09
3	6.55 - 4.30	28.90	9.34
4	4.30 - 2.97	16.35	5.28
5	2.97 - 1.90	9.30	3.00
6	1.90 - 0.96	2.75	0.88
7	0.96 - 0.58	0.20	0.06
8	0.58 - 0.38	0.40	0.12
Filter	<0.38	0.30	0.09
Total Weight (mg)		309.30	

(continued)

Table C-106. (Continued)

Run number	5
Date	12/08/79
Test time (min)	0.417
Water vapor %	25.2
Stack temperature °C	203.9
(°F)	(399.0)
Sampling rate m^3/min	0.038
(acfm)	(1.35)
Volume of sample, cf	0.398

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	≥ 9.96	206.60	61.06
2	9.96 - 6.39	65.10	19.24
3	6.39 - 4.18	32.90	9.72
4	4.18 - 2.89	18.05	5.23
5	2.89 - 1.85	10.95	3.23
6	1.85 - 0.93	3.50	1.03
7	0.93 - 0.56	0.15	0.04
8	0.56 - 0.37	0.35	0.10
Filter	<0.37	0.75	0.22
Total Weight (mg)		338.35	

(continued)

Table C-106. (Concluded)

Run number	6
Date	12/08/79
Test time (min)	0.50
Water vapor %	25.2
Stack temperature ^{o}C	203.9
(^{o}F)	(399.0)
Sampling rate m^3/min	0.035
(acfm)	(1.23)
Volume of sample, cf	0.436

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	$\geq$ 10.43	196.25	60.58
2	10.43 - 6.68	47.30	14.60
3	6.68 - 4.38	31.30	9.66
4	4.38 - 3.03	25.75	7.94
5	3.03 - 1.94	15.40	4.75
6	1.84 - 0.98	6.95	2.14
7	0.98 - 0.59	0.50	0.15
8	0.59 - 0.39	0.20	0.06
Filter	<0.39	0.30	0.09
Total Weight (mg)		323.95	

Table C-107. PARTICULATE SIZE DISTRIBUTION; SCRUBBER D-1 DRYER SCRUBBER INLET, SOUTH

Run number	4
Date	12/07/79
Test time (min)	0.583
Water vapor %	28.5
Stack temperature °C	102.2
(°F)	(216.0)
Sampling rate m^3/min	0.039
(acfm)	(1.38)
Volume of sample, cf	0.587

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	$\geq$ 8.93	234.00	64.83
2	8.93 - 5.73	64.90	17.98
3	5.73 - 3.75	38.60	10.69
4	3.75 - 2.59	14.20	3.93
5	2.59 - 1.66	6.00	1.66
6	1.66 - 0.84	1.50	0.41
7	0.84 - 0.50	0.50	0.13
8	0.50 - 0.33	0.40	0.11
Filter	<0.33	0.80	0.22
Total Weight (mg)		360.90	

(continued)

Table C-107. (Continued)

Run number	5
Date	12/07/79
Test time (min)	0.417
Water vapor %	28.5
Stack temperature °C	101.7
(°F)	(215.0)
Sampling rate m^3/min	0.035
(acfm)	(1.23)
Volume of sample, cf	0.375

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	$\geq$9.47	254.55	76.92
2	9.47 - 6.06	38.30	11.57
3	6.06 - 3.98	24.00	7.25
4	3.98 - 2.75	9.20	2.78
5	2.75 - 1.76	3.70	1.11
6	1.76 - 0.89	0.60	0.18
7	0.89 - 0.53	0.20	0.06
8	0.53 - 0.35	0.00	0
Filter	<0.35	0.35	0.10
Total Weight (mg)		330.90	

(continued)

Table C-107. (Concluded)

Run number	6
Date	12/07/79
Test time (min)	0.50
Water vapor %	28.5
Stack temperature °C	101.7
(°F)	(215.0)
Sampling rate m^3/min	0.038
(acfm)	(1.34)
Volume of sample, cf	0.490

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	≥9.06	233.95	65.91
2	9.06 - 5.81	64.90	18.28
3	5.81 - 3.81	33.70	9.49
4	3.81 - 2.63	14.30	4.02
5	2.63 - 1.68	4.80	1.35
6	1.68 - 0.85	1.80	0.50
7	0.85 - 0.51	0.40	0.11
8	0.51 - 0.33	0.30	0.08
Filter	<0.33	0.80	0.22
Total Weight (mg)		354.95	

Table C-108. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER D-1 DRYER SCRUBBER OUTLET (6 Minute Average)

Type of discharge	stack
Height of discharge point	150 ft
Description of sky	clear
Distance from observer to point	250 ft
Color of plume	white
Date	12/6-8/79

Set no	Run 1 test time (1610-1710) Average opacity	Run 2 test time (1020-1202) Average opacity	Run 3 test time (0829-1017) Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	5	0	0
8	5	0	0
9	0	0	0
10	0	0	0
11		0	0
12		0	0
13		5	0
14		5	0
15		0	0
16		0	0
17		0	0
18			0

Table C-109. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER D-1 DRYER CONVEYOR TRANSFER POINT

Type of discharge	conveyor belt discharge
Height of discharge point	4 ft
Description of sky	clear
Distance from observer to point	20 ft
Color of plume	white

Test no.	1	2	Total
Date	12/07/79	12/07/79	
Test period	1100-1207	1208-1317	
Test duration (sec)	2850	2850	5700
Duration of fugitive emissions (sec)	0	0	0
Fugitive emissions (%)	0	0	0

Table C-110. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER D-1 DRYER CONVEYOR TRANSFER POINT (6 Minute Average)

Type of discharge	stack
Height of discharge point	4 ft
Description of sky	clear
Distance from observer to point	20 ft
Color of plume	white
Date	12/08/79

	Run 1 test time (1300-1400)	Run 2 test time (1200-1300)	Run 3 test time (1400-1500)
Set no	Average opacity	Average opacity	Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0

Table C-111. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER D-2 GRINDER CONVEYOR INLET

Type of discharge	stack
Description of sky	N/A
Distance from observer to point	15 ft
Color of plume	white

Test no.	1	2	3	Total
Date	12/04/79	12/05/79	12/05/79	
Test period	1628-1840	1313-1512	0856-1041	
Test duration (sec)	6055	4500	4380	14935
Duration of fugitive emissions (sec)	0	0	0	0
Fugitive emissions (%)	0	0	0	0

Table C-112. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER D-2 GRINDER CONVEYOR INLET (6 Minute Average)

Type of discharge	stack
Description of sky	N/A
Distance from observer to point	15 ft
Color of plume	white
Date	12/04-05/79

	Run 1 test time (1631-1837)	Run 2 test time (0958-1058)	Run 3 test time (1330-1430)
Set no	Average opacity	Average opacity	Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0		0
9	0		0
10	0		0
11	0		
12	0		
13	0		
14	0		
15	0		
16	0		
17	0		
18	0		
19	0		
20	0		
21	0		

Table C-113. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER E-1 SECONDARY AND TERTIARY CRUSHER, ROTOCLONE DISCHARGE STACK (WEST)

Run number		1	2	3	Average
Date		10/23/75	10/23/75	10/23/75	
Test time - minutes		72	72	72	72
Stack Effluent					
Flow rate	m^3/min (acfm)	855 (30200)	833 (29400)	784 (27700)	824 (29100)
Flow rate	DNm^3/min (dscfm)	801 (28300)	770 (27200)	745 (26300)	772 (27300)
Temperature	°C (°F)	14 (58)	15 (59)	16 (60)	15 (59)
Water vapor	Vol%	2.53	3.60	0.81	2.31
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3 (gr/dscf)		0.009 (0.004)	0.050 (0.022)	0.018 (0.008)	0.026 (0.011)
g/m^3 (gr/acf)		0.008 (0.004)	0.046 (0.020)	0.017 (0.008)	0.024 (0.011)
kg/hr (lb/hr)		0.42 (0.92)	2.3 (5.1)	0.84 (1.8)	1.2 (2.6)
Total Catch					
g/DNm^3 (gr/dscf)		0.010 (0.005)	0.052 (0.023)	0.021 (0.009)	0.028 (0.012)
g/m^3 (gr/acf)		0.010 (0.004)	0.047 (0.021)	0.020 (0.009)	0.026 (0.011)
kg/hr (lb/hr)		0.50 (1.1)	2.4 (5.2)	0.95 (2.1)	1.3 (2.8)

Table C-114. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER E-1 SECONDARY AND TERTIARY CRUSHER, ROTOCLONE DISCHARGE STACK (WEST) (6 Minute Average)

Type of discharge	stack
Height of discharge point	100 ft
Description of background	light blue-gray
Description of sky	overcast
Distance from observer to point	¼ mile
Height of observation point	30 ft above ground
Color of plume	not visible
Date	10/23/79

	Run 1 test time (1130-1724)		
Set no	Average opacity	Average opacity	Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	2
8	0	0	2
9	0	0	2
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	0
17	0	0	0
18	0	0	0
19	0	0	0
20	0	0	0

Table C-115. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE F-1 SECONDARY AND TERTIARY CRUSHER BAGHOUSE OUTLET

Run number		1	2	3	Average
Date		7/13/78	7/13/78	7/14/78	
Test time - minutes		60	60	60	60
Stack Effluent					
Flow rate	m^3/min	424	389	378	397
	(acfm)	(14970)	(13746)	(13330)	(14015)
Flow rate	DNm^3/min	402	371	360	377
	(dscfm)	(14200)	(13100)	(12700)	(13300)
Temperature	°C	24	24	24	24
	(°F)	(76)	(75)	(75)	(75)
Water vapor	Vol%	1.6	1.2	0.9	1.2
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.008	0.009	0.007	0.008
(gr/dscf)		(0.003)	(0.004)	(0.003)	(0.003)
g/m^3		0.007	0.008	0.007	0.007
(gr/acf)		(0.003)	(0.004)	(0.003)	(0.003)
kg/hr		0.183	0.192	0.161	0.179
(lb/hr)		(0.403)	(0.424)	(0.355)	(0.394)
Total Catch					
g/DNm^3		0.016	0.013	0.014	0.014
(gr/dscf)		(0.007)	(0.005)	(0.006)	(0.006)
g/m^3		0.015	0.012	0.014	0.014
(gr/acf)		(0.007)	(0.005)	(0.006)	(0.006)
kg/hr		0.379	0.279	0.306	0.321
(lb/hr)		(0.836)	(0.615)	(0.675)	(0.709)

Table C-116. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE F-1 SECONDARY AND TERTIARY CRUSHER BAGHOUSE OUTLET (6 Minute Average)

Type of discharge	stack
Height of discharge point	60 ft
Description of background	partly cloudy
Description of sky	clear
Distance from observer to point	200 ft
Height of observation point	20 ft
Date	7/13-14/79

	Run 1 test time (1645-1755)	Run 2 test time (1915-2017)	Run 3 test time (0900-1030)
Set no	Average opacity	Average opacity	Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0 (2 mins)	0
12	0 (4 mins)		0
13			0
14			0
15			0

Table C-117. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE F-2 FINE CRUSHER CONVEYOR-TO-CONCENTRATOR, BAGHOUSE INLET

Run number		1	2	3	Average
Date		8/29/78	8/29/78	8/30/78	
Test time - minutes		60	60	60	60
Stack Effluent					
Flow rate	DNm^3/min	833	838	861	844
	(dscfm)	(29400)	(29600)	(30400)	(29800)
Temperature	°C	21	20	18	20
	(°F)	69	68	65	67
Water vapor	Vol%	1.8	2.5	1.3	1.9
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		2.52	2.75	3.73	3.00
(gr/dscf)		(1.10)	(1.20)	(1.63)	(1.31)
kg/hr		125	138	193	152
(lb/hr)		(276)	(304)	(425)	(335)
Total Catch					
g/DNm^3		2.52	2.75	3.73	3.00
(gr/dscf)		(1.10)	(1.20)	(1.63)	(1.31)
kg/hr		126	138	193	152
(lb/hr)		(277)	(305)	(426)	(336)

Table C-118. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE F-2 FINE CRUSHER CONVEYOR-TO-CONCENTRATOR, BAGHOUSE OUTLET

Run number		1	2	3	Average
Date		8/29/78	8/29/78	8/29/78	
Test time - minutes		60	60	60	60
Stack Effluent					
Flow rate	DNm^3/min	918	915	937	923
	(dscfm)	(32400)	(32300)	(33100)	(32600)
Temperature	°C	24	24	21	23
	(°F)	(75)	(75)	(70)	(73)
Water vapor	Vol%	1.6	2.1	0.5	1.4
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.014	0.007	0.007	0.009
(gr/dscf)		(0.006)	(0.003)	(0.003)	(0.004)
kg/hr		0.807	0.328	0.447	0.527
(lb/hr)		(1.78)	(0.724)	(0.986)	(1.16)
Total Catch					
g/DNm^3		0.018	0.009	0.016	0.014
(gr/dscf)		(0.008)	(0.004)	(0.007)	(0.006)
kg/hr		1.06	0.544	0.895	0.833
(lb/hr)		(2.33)	(1.20)	(1.97)	(1.83)

Table C-119. SUMMARY OF VISIBLE EMISSIONS (6 MINUTE AVERAGE): BAGHOUSE F-2 FINE CRUSHER CONVEYOR-TO-CONCENTRATOR, BAGHOUSE OUTLET

Type of discharge	stack
Height of discharge point	60 ft
Description of background	partly cloudy
Description of sky	clear to partly cloudy
Distance from observer to point	200 ft
Height of observation point	50 ft
Date	8/28-29/78

	Run 1 test time (1610-1722)	Run 2 test time (1843-2001)	Run 3 test time (1527-1651)
Set no	Average opacity	Average opacity	Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13		0	0
14			0

Table C-120. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE F-3 ORE CAR DUMP, BAGHOUSE OUTLET

Run number		1	2	3	Average
Date		7/10/78	7/10/78	7/10/78	
Test time - minutes		60	60	60	60
Stack Effluent					
Flow rate	m^3/min	2006	2015	1992	2004
	(acfm)	(70833)	(71142)	(70333)	(70769)
Flow rate	DNm^3/min	1916	1889	1892	1899
	(dscfm)	(67655)	(66692)	(66816)	(67054)
Temperature	°C	27	29	27	28
	(°F)	(80)	(85)	(80)	(82)
Water vapor	Vol%	0.8	1.6	1.2	1.2
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.009	0.007	0.006	0.007
(gr/dscf)		(0.004)	(0.003)	(0.002)	(0.003)
g/m^3		0.009	0.007	0.006	0.007
(gr/acf)		(0.004)	(0.003)	(0.002)	(0.003)
kg/hr		1.06	0.82	0.65	0.84
(lb/hr)		(2.34)	(1.81)	(1.43)	(1.86)
Total Catch					
g/DNm^3		0.015	0.012	0.013	0.013
(gr/dscf)		(0.007)	(0.005)	(0.006)	(0.006)
g/m^3		0.015	0.011	0.011	0.012
(gr/acf)		(0.006)	(0.005)	(0.005)	(0.005)
kg/hr		1.75	1.33	1.47	1.52
(lb/hr)		(3.87)	(2.94)	(3.23)	(3.35)

Table C-121. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE F-3 ORE CAR DUMP, BAGHOUSE OUTLET
(6 Minute Average)

Type of discharge	stack
Height of discharge point	60 ft
Description of background	blue sky
Description of sky	partly cloudly
Distance from observer to point	200 ft
Height of observation point	ground level
Date	7/10-11/78

	Run 1 test time (1325-1513)	Run 2 test time (1724-1912)	Run 3 test time (1342-1456)
Set no	Average opacity	Average opacity	Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0 (2 mins)
14	0	0	
15	0	0	
16	0	0	
17	0	0	
18	0	0	

Table C-122. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER F-1 FINE CRUSHER STACK, SCRUBBER OUTLET

Run number		1
Date		9/11/73
Test time - minutes		120
Stack Effluent		
Flow rate	m^3/min (acfm)	481 (16989)
Flow rate	DNm^3/min (dscfm)	471 (16644)
Temperature	°C (°F)	15.9 (60.7)
Water vapor	Vol%	1.0
Particulate Emissions		
Probe and Filter Catch		
g/DNm^3 (gr/dscf)		0.011 (0.005)
g/m^3 (gr/acf)		0.010 (0.005)
kg/hr (lb/hr)		0.30 (0.66)
kg/Mg (lb/ton)		0.00073 (0.00146)
Total Catch		
g/DNm^3 (gr/dscf)		0.011 (0.005)
g/m^3 (gr/acf)		0.011 (0.005)
kg/hr (lb/hr)		0.32 (0.70)
kg/Mg (lb/ton)		0.00078 (0.00156)

Table C-123. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE G-1 CRUSHER BAGHOUSE, TOTAL INLET DUCT

Run number		1	2	3	Average
Date		10/25/79	10/25/79	10/26/79	
Test time - minutes		96	96	96	96
Production rate	Mg/hr	2209	1681	1875	1921
	(TPH)	(2435)	(1853)	(2067)	(2118)
Stack Effluent					
Flow rate	m^3/min	2359	2520	2526	2469
	(acfm)	(83300)	(89000)	(89200)	(87167)
Flow rate	DNm^3/min	1824	1963	1971	1919
	(dscfm)	(64400)	(69300)	(69600)	(67767)
Temperature	°C	24	22	22	23
	(°F)	(75)	(72)	(71)	(73)
Water vapor	Vol%	1.7	1.5	1.5	1.6
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		6.43	5.99	3.87	5.43
(gr/dscf)		(2.81)	(2.62)	(1.69)	(2.37)
g/m^3		4.96	4.67	3.02	4.22
(gr/acf)		(2.17)	(2.04)	(1.32)	(1.84)
kg/hr		703	707	458	622
(lb/hr)		(1549)	(1558)	(1010)	(1372)
kg/Mg		0.33	0.42	0.25	0.33
(lb/ton)		(0.66)	(0.84)	(0.49)	(0.66)

Table C-124. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE G-1 CRUSHER GRIZZLEY EAST DUCT, INLET TO BAGHOUSE

Run number		1	2	3	Average
Date		10/25/79	10/25/79	10/26/79	
Test time - minutes		90	90	90	90
Stack Effluent					
Flow rate	m^3/min	643	705	702	683
	(acfm)	(22700)	(24900)	(24800)	(24133)
Flow rate	DNm^3/min	493	549	555	532
	(dscfm)	(17400)	(19400)	(19600)	(18800)
Temperature	°C	24	24	21	23
	(°F)	(76)	(76)	(70)	(74)
Water vapor	Vol%	2.7	1.2	0.6	1.5
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.295	0.133	0.156	0.194
(gr/dscf)		(0.129)	(0.058)	(0.068)	(0.085)
g/m^3		0.227	0.103	0.124	0.151
(gr/acf)		(0.099)	(0.045)	(0.054)	(0.066)
kg/hr		8.71	4.39	5.22	6.10
(lb/hr)		(19.2)	(9.67)	(11.5)	(13.5)

Table C-125. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE G-1 CRUSHER HOOD DUCT, INLET TO BAGHOUSE

Run number		1	2	3	Average
Date		10/25/79	10/25/79	10/26/79	
Test time - minutes		96	96	96	96
Stack Effluent					
Flow rate	m^3/min	685	700	685	690
	(acfm)	(24200)	(24700)	(24200)	(24367)
Flow rate	DNm^3/min	535	544	544	541
	(dscfm)	(18900)	(19200)	(19200)	(19100)
Temperature	°C	24	22	18	21
	(°F)	(75)	(72)	(64)	(70)
Water vapor	Vol%	1.1	1.7	1.2	1.3
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		3.55	3.39	2.29	3.07
(gr/dscf)		(1.55)	(1.48)	(1.00)	(1.34)
g/m^3		2.77	2.63	1.83	2.41
(gr/acf)		(1.21)	(1.15)	(0.80)	(1.05)
kg/hr		114	111	75	100
(lb/hr)		(251)	(244)	(166)	(220)

Table C-126. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE G-1 CRUSHER BAGHOUSE, OUTLET DUCT

Run number		1	2	3	Average
Date		10/25/79	10/25/79	10/26/79	
Test time - minutes		96	96	96	96
Production rate	Mg/hr	2209	1681	1875	1921
	(TPH)	(2435)	(1853)	(2067)	(2118)
Stack Effluent					
Flow rate	m^3/min	2809	2795	2974	2859
	(acfm)	(99200)	(98700)	(105000)	(100967)
Flow rate	DNm^3/min	2178	2161	2325	2221
	(dscfm)	(76900)	(76300)	(82100)	(78433)
Temperature	°C	26	24	23	24
	(°F)	(78)	(76)	(73)	(76)
Water vapor	Vol%	1.4	2.3	2.0	1.9
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.011	0.011	0.016	0.013
(gr/dscf)		(0.005)	(0.005)	(0.007)	(0.006)
g/m^3		0.010	0.008	0.013	0.010
(gr/acf)		(0.004)	(0.003)	(0.006)	(0.004)
kg/hr		1.62	1.33	2.27	1.74
(lb/hr)		(3.58)	(2.93)	(5.01)	(3.84)
kg/Mg		0.001	0.001	0.001	0.001
(lb/ton)		(0.002)	(0.002)	(0.002)	(0.002)

Table C-127. PARTICULATE SIZE DISTRIBUTION; BAGHOUSE G-1 CRUSHER BAGHOUSE TOTAL INLET DUCT

Run number	1
Date	10/26/79
Test time (min)	4.0
Water vapor %	1.6
Stack temperature °C	23
(°F)	(73)
Sampling rate m^3/min	0.014
(acfm)	(0.48)
Volume of sample, cf	2.26

Plate no.	Effective Aerodynamic Diameter (EAD) (micrometers)	Weight (milligrams)	Percent per plate
1	14.0	214.2	93.4
2	8.6	3.2	1.4
3	5.6	8.7	3.8
4	4.0	1.4	0.6
5	2.6	0.5	0.2
6	1.3	0.5	0.2
7	0.82	0.2	0.1
8	0.55	0.1	0.1
Filter		0.5	0.2
Total Weight (mg)		229.3	

(continued)

Table C-127. (Continued)

Run number	2
Date	10/26/79
Test time (min)	3.0
Water vapor %	1.6
Stack temperature ^{o}C	23
(^{o}F)	(73)
Sampling rate m^3/min	0.014
(acfm)	(0.48)
Volume of sample, cf	1.67

Plate no.	EAD (micrometers)	Weight (milligrams)	Percent per plate
1	14.0	134.0	88.9
2	8.6	12.2	8.0
3	5.6	2.2	1.5
4	4.0	0.9	0.6
5	2.6	0.4	0.3
6	1.3	0.2	0.1
7	0.82	0.3	0.2
8	0.55	0.2	0.1
Filter		0.4	0.3
Total Weight (mg)		150.8	

(continued)

Table C-127. (Concluded)

Run number	3
Date	10/26/79
Test time (min)	3.0
Water vapor %	1.6
Stack temperature ^{o}C	23
(^{o}F)	(73)
Sampling rate m^3/min	0.013
(acfm)	(0.46)
Volume of sample, cf	1.61

Plate no.	EAD (micrometers)	Weight (milligrams)	Percent per plate
1	13.8	195.9	96.6
2	8.8	4.5	2.2
3	5.9	1.4	0.7
4	4.1	0.2	0.1
5	2.7	0.1	0.05
6	1.3	0.1	0.05
7	0.9	0.1	0.05
8	0.6	0.4	0.2
Filter		0.1	0.05
Total Weight (mg)		202.8	

Table C-128. PARTICULATE SIZE DISTRIBUTION; BAGHOUSE G-1 CRUSHER GRIZZLEY EAST DUCT, INLET TO BAGHOUSE

Run number	1
Date	10/25/79
Test time (min)	5.0
Water vapor %	1.0
Stack temperature ^{o}C	23
(^{o}F)	(74)
Sampling rate m^3/min	0.016
(acfm)	(0.58)
Volume of sample, cf	3.79

Plate no.	Effective Aerodynamic Diameter (EAD) (micrometers)	Weight (milligrams)	Percent per plate
1	12.5	5.4	48.2
2	8.0	3.2	28.6
3	5.2	1.1	9.8
4	3.7	0.1	0.9
5	2.3	0.3	2.7
6	1.2	0.2	1.8
7	0.74	0.5	4.5
8	0.49	0.0	0.0
Filter		0.0	0.0
Total Weight (mg)		11.2	

(continued)

Table C-128. (Continued)

Run number	2
Date	10/25/79
Test time (min)	5.0
Water vapor %	1.0
Stack temperature °C	23
(°F)	(74)
Sampling rate m^3/min	0.016
(acfm)	(0.58)
Volume of sample, cf	3.74

Plate no.	EAD (micrometers)	Weight (milligrams)	Percent per plate
1	12.5	1.6	32.0
2	8.0	1.8	36.0
3	5.2	0.6	12.0
4	3.7	0.1	2.0
5	2.3	0.1	2.0
6	1.2	0.2	4.0
7	0.74	0.3	6.0
8	0.49	0.1	2.0
Filter		0.2	4.0
Total Weight (mg)		5.0	

(continued)

Table C-128. (Concluded)

Run number	3
Date	10/25/79
Test time (min)	5.0
Water vapor %	1.0
Stack temperature ^{o}C	23
(^{o}F)	(74)
Sampling rate m^3/min	0.017
(acfm)	(0.60)
Volume of sample, cf	3.90

Plate no.	EAD (micrometers)	Weight (milligrams)	Percent per plate
1	12.0	2.6	53.1
2	7.8	0.6	12.2
3	5.3	0.2	4.1
4	3.7	0.1	2.0
5	2.3	0.1	2.0
6	1.2	0.3	6.1
7	0.73	0.4	8.2
8	0.47	0.2	4.1
Filter		0.4	8.2
Total Weight (mg)		4.9	

Table C-129. PARTICULATE SIZE DISTRIBUTION; BAGHOUSE G-1 CRUSHER HOOD DUCT, INLET TO BAGHOUSE

Run number	1
Date	10/25/79
Test time (min)	5
Water vapor %	1.3
Stack temperature °C	21
(°F)	(70)
Sampling rate m^3/min	0.021
(acfm)	(0.75)
Volume of sample, cf	4.89

Plate no.	Effective Aerodynamic Diameter (EAD) (micrometers)	Weight (milligrams)	Percent per plate
1	11.3	45.9	49.6
2	7.0	31.3	33.8
3	4.5	7.0	7.6
4	3.5	2.7	2.9
5	2.1	1.4	1.5
6	1.1	1.2	1.3
7	0.64	0.6	0.6
8	0.64 - 0.43	0.8	0.9
Filter		1.6	1.8
Total Weight (mg)		92.5	

(continued)

Table C-129. (Continued)

Run number	2
Date	10/25/79
Test time (min)	5.0
Water vapor %	1.3
Stack temperature °C	21
(°F)	(70)
Sampling rate m^3/min	0.021
(acfm)	(0.75)
Volume of sample, cf	4.89

Plate no.	EAD (micrometers)	Weight (milligrams)	Percent per plate
1	11.3	40.9	56.1
2	7.0	17.6	24.1
3	4.5	8.4	11.5
4	3.5	1.3	1.8
5	2.05	1.4	1.9
6	1.05	0.6	0.8
7	0.64	0.6	0.8
8	0.43	0.4	0.6
Filter		1.8	2.4
Total Weight (mg)		72.9	

(continued)

Table C-129. (Concluded)

Run number	3
Date	10/25/79
Test time (min)	4
Water vapor %	1.3
Stack temperature ^{o}C	21
(^{o}F)	(70)
Sampling rate m^3/min	0.022
(acfm)	(0.77)
Volume of sample, cf	3.99

Plate no.	EAD (micrometers)	Weight (milligrams)	Percent per plate
1	11.0	33.8	47.5
2	6.8	27.0	37.9
3	4.6	4.9	6.9
4	3.2	1.8	2.5
5	2.0	0.7	1.0
6	1.0	0.3	0.4
7	0.63	0.5	0.7
8	0.42	0.6	0.8
Filter		1.7	2.3
Total Weight (mg)		71.2	

Table C-130. PARTICULATE SIZE DISTRIBUTION; BAGHOUSE G-1 CRUSHER BAGHOUSE OUTLET DUCT

Run number	1
Date	10/25/79
Test time (min)	60
Water vapor %	1.9
Stack temperature °C	23
(°F)	(74)
Sampling rate m^3/min	0.020
(acfm)	(0.69)
Volume of sample, cf	51.95

Plate no.	Effective Aerodynamic Diameter (EAD) (micrometers)	Weight (milligrams)	Percent per plate
1	11.5	1.3	25.5
2	7.2	0.8	15.7
3	4.8	0.3	5.9
4	3.4	0.5	9.8
5	2.2	0.3	5.9
6	1.1	0.3	5.9
7	0.66	0.6	11.8
8	0.45	0.5	9.8
Filter		0.5	9.7
Total Weight (mg)		5.1	

Table C-131. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE G-1 CRUSHER BAGHOUSE, OUTLET DUCT (6 Minute Average)

Type of discharge	stack
Height of discharge point	15 ft above roof
Description of background	Multicolored mine wall
Description of sky	N/A
Distance from observer to point	50 ft
Height of observation point	15 ft above roof
Color of plume	gray
Date	10/25/80

	Run 1 test time (1630-1800)
Set no	Average opacity
1	0
2	0
3	0
4	0
5	0
6	0
7	1
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0

Table C-132. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE G-1 COARSE ORE TRANSFER POINT (6 Minute Average)

Type of discharge	conveyor belt discharge
Height of discharge point	85 ft
Description of sky	N/A
Distance from observer to point	15 ft
Height of observation point	85 ft
Color of plume	N/A
Date	10/26/79

	Run 1 test time (1850-1950)	Run 2 test time (2000-2050)	Run 3 test time (2120-2220)
Set no	Average opacity	Average opacity	Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0

Table C-133. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE G-1 COARSE ORE TRANSFER POINT

Type of discharge	conveyor belt discharge
Height of discharge point	85 ft
Description of sky	N/A
Distance from observer to point	15 ft
Height of observation point	85 ft
Color of plume	N/A

Test no.	1	2	3	Total
Date	10/26/79	10/26/79	10/26/79	
Test period	1850-2000	2005-2025	2120-2230	
Test duration (sec)	7200	7200	7200	21600
Duration of fugitive emissions (sec)	0	0	0	0
Fugitive emissions (%)	0	0	0	0

Table C-134. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE G-1 EAST GRIZZLY SCREEN (6 Minute Average)

Type of discharge	grizzly chute
Height of discharge point	10-20 ft above floor
Description of sky	N/A
Distance from observer to point	10 ft
Color of plume	N/A
Date	10/25-26/79

	Run 1 test time (1630-1838)	Run 2 test time (2050-2224)	Run 3 test time (0040-0230)
Set no	Average opacity	Average opacity	Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6		0	0
7		0	0
8		0	0
9		0	0
10		0	0
11		0	0
12		0	0

Table C-135. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE G-1
EAST GRIZZLY SCREEN

Type of discharge	grizzly chute
Height of discharge point	10-20 ft above floor
Description of sky	N/A
Distance from observer to point	10 ft
Color of plume	N/A
Date	10/25/79

Test no.	1	2	3	Total
Date	10/25/79	10/25/79	10/25/79	
Test period	1630-1830	2050-2224	0045-0235	
Test duration (sec)	5400	11940	17400	34740
Duration of fugitive emissions (sec)	0	0	16	16
Fugitive emissions (%)	0	0	0.09	0.05

Table C-136. SUMMARY CF VISIBLE EMISSIONS; BAGHOUSE G-1 WEST GRIZZLY SCREEN (6 Minute Average)

Type of discharge	grizzly chute
Height of discharge point	10-20 ft above floor
Description of sky	N/A
Distance from observer to point	30 ft
Color of plume	N/A
Date	10/25/79

	Run 1 test time (1630-1800)	Run 2 test time (2050-2224)	Run 3 test time (0040-0235)
Set no	Average opacity	Average opacity	Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	6
6		0	3
7		0	2
8		0	0
9		0	0
10		0	0
11			0
12			0
13			0

Table C-137. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE G-1 WEST GRIZZLY SCREEN

Type of discharge	grizzly chute
Height of discharge point	10-20 ft above floor
Description of sky	N/A
Distance from observer to point	30 ft
Color of plume	N/A

Test no.	1	2	3	Total
Date	10/25/79	10/25/79	10/25/79	
Test period	1630-1838	2050-2224	0045-0235	
Test duration (sec)	5580	11940	17400	34920
Duration of fugitive emissions (sec)	25	0	209	234
Fugitive emissions (%)	0.4	0	1.2	0.7

Table C-138. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE G-2 TRUCK DUMP BAGHOUSE, INLET DUCT

Run number		1	2	3	Average
Date		10/26/79	10/26/79	10/26/79	
Test time - minutes		60	60	60	60
Production rate	Mg/hr	2059	2074	2002	2045
	(TPH)	(2270)	(2287)	(2207)	(2255)
Stack Effluent					
Flow rate	m^3/min	2161	2172	2206	2180
	(acfm)	(76300)	(76700)	(77900)	(76967)
Flow rate	DNm^3/min	1815	1826	1880	1841
	(dscfm)	(64100)	(64500)	(66400)	(65000)
Temperature	°C	6	6	3	5
	(°F)	(43)	(43)	(38)	(41)
Water vapor	Vol%	1.7	1.3	1.4	1.5
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.384	0.307	0.222	0.304
(gr/dscf)		(0.168)	(0.134)	(0.097)	(0.133)
g/m^3		0.322	0.263	0.190	0.259
(gr/acf)		(0.141)	(0.115)	(0.083)	(0.113)
kg/hr		41.8	34.2	25.1	33.7
(lb/hr)		(92.1)	(75.5)	(55.4)	(74.3)
kg/Mg		0.01	0.005	0.015	0.01
(lb/ton)		(0.02)	(0.01)	(0.03)	(0.02)

Table C-139. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE G-2 TRUCK DUMP BAGHOUSE, OUTLET DUCT

Run number		1	2	3	Average
Date		10/26/79	10/26/79	10/26/79	
Test time - minutes		64	64	64	64
Production rate	Mg/hr (TPH)	2059 (2270)	2074 (2287)	2002 (2207)	2045 (2255)
Stack Effluent					
Flow rate	m^3/min (acfm)	2368 (83600)	2331 (82300)	2396 (84600)	2365 (83500)
Flow rate	DNm^3/min (dscfm)	1960 (69200)	1943 (68600)	2008 (70900)	1970 (69567)
Temperature	°C (°F)	13 (55)	12 (54)	11 (51)	12 (53)
Water vapor	Vol%	1.1	0.45	0.70	2.25
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3 (gr/dscf)		0.046 (0.020)	0.043 (0.019)	0.032 (0.014)	0.040 (0.018)
g/m^3 (gr/acf)		0.038 (0.017)	0.036 (0.016)	0.027 (0.012)	0.034 (0.015)
kg/hr (lb/hr)		5.4 (12.0)	5.0 (11.0)	3.9 (8.56)	4.8 (10.5)
kg/Mg (lb/ton)		(0.003)	(0.002)	(0.004)	(0.003)

Table C-140. PARTICULATE SIZE DISTRIBUTION; BAGHOUSE G-2 TRUCK DUMP BAGHOUSE INLET

Run number	1
Date	10/26/79
Test time (min)	15.0
Water vapor %	1.5
Stack temperature ^{o}C	4
(^{o}F)	(40)
Sampling rate m^3/min	0.019
(acfm)	(0.66)
Volume of sample, cf	12.06

Plate no.	Effective Aerodynamic Diameter (EAD) (micrometers)	Weight (milligrams)	Percent per plate
1	11.4	3.3	11.8
2	7.2	6.4	22.9
3	4.9	8.1	29.0
4	3.4	4.6	16.5
5	2.1	2.2	7.9
6	1.1	0.7	2.5
7	0.65	0.7	2.5
8	0.44	0.8	2.9
Filter		1.1	4.0
Total Weight (mg)		27.9	

(continued)

Table C-140. (Continued)

Run number	2
Date	10/26/79
Test time (min)	15.0
Water vapor %	1.5
Stack temperature °C	4
(°F)	(40)
Sampling rate m^3/min	0.019
(acfm)	(0.67)
Volume of sample, cf	12.10

Plate no.	EAD (micrometers)	Weight (milligrams)	Percent per plate
1	11.4	2.2	10.5
2	7.9	4.4	21.1
3	4.9	6.8	32.5
4	3.4	3.7	17.7
5	2.1	0.9	4.3
6	1.1	0.6	2.9
7	0.65	0.7	3.4
8	0.44	0.4	1.9
Filter		1.2	5.7
Total Weight (mg)		20.9	

Table C-140. (Concluded)

Run number	3
Date	10/26/79
Test time (min)	15.0
Water vapor %	1.5
Stack temperature °C	4
(°F)	(40)
Sampling rate m^3/min	0.019
(acfm)	(0.67)
Volume of sample, cf	12.23

Plate no.	EAD (micrometers)	Weight (milligrams)	Percent per plate
1	11.4	3.6	15.5
2	7.9	5.2	22.4
3	4.9	7.6	32.8
4	3.4	2.1	9.1
5	2.1	1.7	7.3
6	1.1	0.5	2.2
7	0.65	0.5	2.2
8	0.44	0.8	3.5
Filter		1.2	5.0
Total Weight (mg)		23.2	

Table C-141. PARTICULATE SIZE DISTRIBUTION; BAGHOUSE G-2 TRUCK DUMP BAGHOUSE OUTLET

Run number	1
Date	10/25/79
Test time (min)	90
Water vapor %	0.75
Stack temperature ^oC	11
(^oF)	(52)
Sampling rate m^3/min	0.021
(acfm)	(0.75)
Volume of sample, cf	82.72

Plate no.	Effective Aerodynamic Diameter (EAD) (micrometers)	Weight (milligrams)	Percent per plate
1	11.2	11.3	35.0
2	6.8	10.7	33.1
3	4.5	5.5	17.0
4	3.2	1.8	5.6
5	2.0	1.0	3.1
6	1.0	0.5	1.6
7	0.62	0.4	1.2
8	0.42	0.3	0.9
Filter		0.8	2.5
Total Weight (mg)		32.3	

Table C-142. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE G-2 TRUCK DUMP BAGHOUSE, OUTLET DUCT (6 Minute Average)

Type of discharge	stack
Height of discharge point	15 ft above roof
Description of background	multicolored mine wall
Description of sky	partly cloudy-cloudy
Distance from observer to point	100-150 ft
Height of observation point	15 ft above roof
Color of plume	gray
Date	10/26/79

	Run 1 test time (1445-1545; 1545-1629)	Run 2 test time (1726-1753; 1802-1837)
Set no	Average opacity	Average opacity
1	0	1
2	1	0
3	1	4
4	0	0
5	1	1 (3 mins)
6	0	0
7	3	2
8	2	0
9	0	4
10	3	1
11	1	0 (5 mins)
12	7 (4 mins)	

Table C-143. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE H-1 FINE ORE STORAGE BINS OUTLET

Run number		1	2	3	Average
Date		6/25/80	6/25/80	6/25/80	
Test time - minutes		96	96	96	96
Stack Effluent					
Flow rate	m^3/min	433	442	433	436
	(acfm)	(15300)	(15600)	(15300)	(15400)
Flow rate	DNm^3/min	405	411	396	404
	(dscfm)	(14300)	(14500)	(14000)	(14267)
Temperature	°C	33	34	34	34
	(°F)	(91)	(93)	(94)	(93)
Water vapor	Vol%	2.9	3.2	3.8	3.3
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.007	0.007	0.009	0.007
(gr/dscf)		(0.003)	(0.003)	(0.004)	(0.003)
g/m^3		0.007	0.007	0.009	0.007
(gr/acf)		(0.003)	(0.003)	(0.004)	(0.003)
kg/hr		0.176	0.178	0.219	0.191
(lb/hr)		(0.388)	(0.392)	(0.482)	(0.421)

Table C-144. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE H-1 FINE ORE STORAGE BINS OUTLET (6 Minute Average)

Type of discharge	stack
Height of discharge point	125 ft
Description of sky	clear
Distance from observer to point	350 ft
Height of observation point	100 ft
Color of plume	N/A
Date	6/25/80

Set no	Run 1 test time (0926-1108) Average opacity	Run 2 test time (1209-1345) Average opacity	Run 3 test time (1442-1618) Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	0

Table C-145. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER H-1 SHIP UNLOADING AREA SCRUBBER INLET

Run number		1
Date		6/24/80
Test time - minutes		96
Stack Effluent		
Flow rate	m^3/min (acfm)	2543 (89800)
Flow rate	DNm^3/min (dscfm)	2339 (82600)
Temperature	°C (°F)	31 (87)
Water vapor	Vol%	3.7
Particulate Emissions		
Probe and Filter Catch		
g/DNm^3 (gr/dscf)		2.61 (1.14)
g/m^3 (gr/acf)		2.40 (1.05)
kg/hr (lb/hr)		366 (806)

Table C-146. SUMMARY OF EMISSION TEST RESULTS; SCRUBBER H-1 SHIP UNLOADING AREA SCRUBBER OUTLET

Run number		1
Date		6/24/80
Test time - minutes		96
Stack Effluent		
Flow rate	m^3/min (acfm)	2614 (92300)
Flow rate	DNm^3/min (dscfm)	2390 (84400)
Temperature	°C (°F)	35 (95)
Water vapor	Vol%	3.5
Particulate Emissions		
Probe and Filter Catch		
g/DNm^3 (gr/dscf)		0.039 (0.017)
g/m^3 (gr/acf)		0.036 (0.016)
kg/hr (lb/hr)		5.7 (12.6)

Table C-147. PARTICULATE SIZE DISTRIBUTION; SCRUBBER H-1 SHIP UNLOADING AREA SCRUBBER OUTLET

Run number	
Date	06/24/80
Test time (min)	95.0
Water vapor %	3.5
Stack temperature °C	24
(°F)	(76)
Sampling rate m^3/min	0.017
(acfm)	(0.61)
Volume of sample, cf	59.3

Plate no.	Effective Aerodynamic Diameter (EAD) (micrometers)	Weight (milligrams)	Percent per plate
1	12.5	18.9	32.7
2	7.8	0.5	0.8
3	5.2	0.9	1.6
4	3.6	1.8	3.1
5	2.7	4.5	7.8
6	1.2	15.4	26.6
7	.71	8.7	15.1
8	.48	4.8	8.3
Filter		2.3	4.0
Total Weight (mg)		57.8	

Table C-148. SUMMARY OF VISIBLE EMISSIONS; SCRUBBER H-1 SHIP UNLOADING AREA SCRUBBER OUTLET

Type of discharge	stack
Height of discharge point	5 ft
Description of sky	clear
Distance from observer to point	40 ft
Height of observation point	25 ft
Color of plume	rust
Date	6/24/80

	Run 1 test time (0808-0945)
Set no	Average opacity
1	18
2	19
3	20
4	19
5	20
6	19
7	18
8	19
9	18
10	20
11	19
12	19
13	19
14	19
15	19
16	20 (7 mins)

Table C-149. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE I-1
PRIMARY CRUSHER INLET TO BAGHOUSE I-1

Run number		1	2	3	Average
Date		1/15/80	1/16/80	1/16/80	
Test time - minutes		140	92	84	105.3
Production rate	Mg/hr	112	111	111	111
	(TPH)	(124)	(125)	(125)	(124)
Stack Effluent					
Flow rate	m^3/min	64	66	67	66
	(acfm)	(2254)	(2315)	(2372)	(2314)
Flow rate	DNm^3/min	52	54	55	54
	(dscfm)	(1828)	(1904)	(1938)	(1890)
Temperature	°C	19.9	18.3	21.1	19.8
	(°F)	(67.9)	(65.0)	(70.0)	(67.6)
Water vapor	Vol%	1.5	1.9	1.6	1.7
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.525	0.649	0.953	0.709
(gr/dscf)		(0.229)	(0.284)	(0.417)	(0.310)
g/m^3		0.426	0.534	0.779	0.579
(gr/acf)		(0.186)	(0.233)	(0.340)	(0.253)
kg/hr		1.63	2.10	3.14	2.29
(lb/hr)		(3.59)	(4.63)	(6.92)	(5.05)
kg/Mg		0.015	0.019	0.028	0.021
(lb/ton)		(0.029)	(0.037)	(0.056)	(0.041)

Table C-150. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE I-1 CONVEYOR TRANSFER INLET (SECONDARY AND TERTIARY CRUSHERS) TO BAGHOUSE I-1

Run number		1	2	3	Average
Date		1/15/80	1/16/80	1/16/80	
Test time - minutes		140	89	84	104.1
Production rate	Mg/hr (TPH)	112 (124)	111 (125)	111 (125)	111 (124)
Stack Effluent					
Flow rate	m^3/min (acfm)	153 (5391)	188 (6655)	171 (6056)	171 (6034)
Flow rate	DNm^3/min (dscfm)	123 (4335)	154 (5455)	138 (4887)	139 (4893)
Temperature	°C (°F)	20.5 (68.9)	20.4 (68.7)	20.5 (68.9)	20.5 (68.8)
Water vapor	Vol%	2.1	1.5	3.0	2.2
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3 (gr/dscf)		0.616 (0.269)	1.030 (0.450)	0.591 (0.258)	0.746 (0.326)
g/m^3 (gr/acf)		0.496 (0.217)	0.844 (0.369)	0.477 (0.208)	0.606 (0.265)
kg/hr (lb/hr)		4.54 (10.01)	9.55 (21.05)	4.90 (10.81)	6.33 (13.96)
kg/Mg (lb/ton)		0.040 (0.081)	0.086 (0.169)	0.044 (0.087)	0.057 (0.112)

Table C-151. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE I-1 ORE STORAGE RECLAIM INLET TO BAGHOUSE I-1

Run number		1	2	3	Average
Date		1/15/80	1/16/80	1/16/80	
Test time - minutes		140	84	84	102.6
Production rate	Mg/hr	112	111	111	111
	(TPH)	(124)	(125)	(125)	(124)
Stack Effluent					
Flow rate	m^3/min	271	275	291	279
	(acfm)	(9567)	(9695)	(10280)	(9847)
Flow rate	DNm^3/min	221	223	238	227
	(dscfm)	(7791)	(7874)	(8417)	(8027)
Temperature	°C	13.2	19.6	16.7	16.5
	(°F)	(55.7)	(67.3)	(62.1)	(61.7)
Water vapor	Vol%	2.2	1.6	1.9	1.9
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.092	0.139	0.078	0.103
(gr/dscf)		(0.040)	(0.061)	(0.034)	(0.045)
g/m^3		0.075	0.113	0.064	0.084
(gr/acf)		(0.033)	(0.049)	(0.028)	(0.037)
kg/hr		1.22	1.85	1.11	1.40
(lb/hr)		(2.70)	(4.09)	(2.45)	(3.08)
kg/Mg		0.011	0.017	0.010	0.013
(lb/ton)		(0.022)	(0.033)	(0.020)	(0.025)

Table C-152. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE I-1 BAGHOUSE OUTLET

Run number		1	2	3	Average
Date		1/15/80	1/16/80	1/16/80	
Test time - minutes		144	103	96	114.1
Production rate	Mg/hr	112	111	111	111
	(TPH)	(124)	(125)	(125)	(124)
Stack Effluent					
Flow rate	m^3/min	601	635	624	620
	(acfm)	(21238)	(22441)	(22043)	(21907)
Flow rate	DNm^3/min	495	529	522	515
	(dscfm)	(17476)	(18669)	(18422)	(18189)
Temperature	°C	15.8	15.5	15.6	15.6
	(°F)	(60.4)	(60.0)	(60.0)	(60.1)
Water vapor	Vol%	1.6	1.9	1.4	1.6
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.018	0.017	0.009	0.015
(gr/dscf)		(0.008)	(0.008)	(0.004)	(0.007)
g/m^3		0.015	0.015	0.008	0.013
(gr/acf)		(0.007)	(0.006)	(0.003)	(0.006)
kg/hr		0.54	0.55	0.29	0.46
(lb/hr)		(1.20)	(1.22)	(0.65)	(1.02)
kg/Mg		0.005	0.005	0.003	0.004
(lb/ton)		(0.010)	(0.010)	(0.005)	(0.008)

Table C-153. PARTICULATE SIZE DISTRIBUTION; BAGHOUSE I-1 SECONDARY CRUSHER INLET TO BAGHOUSE I-1

Run number	1
Date	01/16/80
Test time (min)	30
Water vapor %	1.7
Stack temperature °C	18
(°F)	(65.0)
Sampling rate m^3/min	0.020
(dscfm)	(0.568)
(acfm)	(0.690)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>11.78	58.88	28.23
2	11.78 - 7.35	22.43	10.75
3	7.35 - 4.98	13.12	6.29
4	4.98 - 3.39	6.58	3.15
5	3.39 - 2.17	2.85	1.37
6	2.17 - 1.08	2.09	1.00
7	1.08 - 0.66	1.20	0.58
8	0.66 - 0.44	0.54	0.26
Filter	<0.44	100.91	48.37
Total Weight (mg)		208.6	

(continued)

Table C-153. (Continued)

Run number	2
Date	01/16/80
Test time (min)	20.0
Water vapor %	1.7
Stack temperature °C	18
(°F)	(65.0)
Sampling rate m^3/min	0.013
(dscfm)	(0.390)
(acfm)	(0.473)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>14.25	69.40	61.48
2	14.25 - 8.89	20.23	17.92
3	8.89 - 6.03	12.44	11.02
4	6.03 - 4.11	4.09	3.62
5	4.11 - 2.64	3.97	3.52
6	2.64 - 1.32	2.09	1.85
7	1.32 - 0.81	0.52	0.46
8	0.81 - 0.54	0.07	0.06
Filter	<0.54	0.07	0.06
Total Weight (mg)		112.8	

(continued)

Table C-153. (Concluded)

Run number	3
Date	01/16/80
Test time (min)	20.0
Water vapor %	1.7
Stack temperature °C	18
(°F)	(65.0)
Sampling rate m^3/min	0.013
(dscfm)	(0.383)
(acfm)	(0.465)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>14.37	63.07	44.65
2	14.37 - 8.97	15.94	11.28
3	8.97 - 6.08	15.56	11.02
4	6.08 - 4.14	14.35	10.16
5	4.14 - 2.66	14.91	10.56
6	2.66 - 1.33	12.39	8.77
7	1.33 - 0.82	4.09	2.90
8	0.82 - 0.54	0.92	0.65
Filter	<0.54	0.02	0.01
Total Weight (mg)		141.2	

Table C-154. PARTICULATE SIZE DISTRIBUTION; BAGHOUSE I-1 CONVEYOR TRANSFER INLET TO BAGHOUSE I-1

Run number	1
Date	01/16/80
Test time (min)	20.00
Water vapor %	2.2
Stack temperature °C	21
(°F)	(70.0)
Sampling rate m^3/min	0.016
(dscfm)	(0.468)
(acfm)	(0.576)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>12.93	25.07	43.76
2	12.93 - 8.07	9.51	16.70
3	8.07 - 5.47	8.31	14.51
4	5.47 - 3.72	6.08	10.61
5	3.72 - 2.39	4.19	7.31
6	2.39 - 1.19	2.92	5.10
7	1.19 - 0.73	0.52	0.91
8	0.73 - 0.48	0.00	0
Filter	<0.48	0.63	1.10
Total Weight (mg)		57.29	

(continued)

Table C-154. (Continued)

Run number	2
Date	01/16/80
Test time (min)	20.0
Water vapor %	2.2
Stack temperature ^{o}C	21
(^{o}F)	(70.0)
Sampling rate m^{3}/min	0.015
(dscfm)	(0.412)
(acfm)	(0.526)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>13.53	32.19	46.35
2	13.53 - 8.44	13.73	19.77
3	8.44 - 5.72	10.53	15.16
4	5.72 - 3.90	6.24	8.98
5	3.90 - 2.50	3.90	5.62
6	2.50 - 1.25	2.55	3.67
7	1.25 - 0.76	0.31	0.45
8	0.76 - 0.50	0.00	0
Filter	<0.50	0.00	0
Total Weight (mg)		69.45	

(continued)

Table C-154. (Concluded)

Run number	3
Date	01/16/80
Test time (min)	21.0
Water vapor %	2.20
Stack temperature °C	21
(°F)	(70.0)
Sampling rate m^3/min	0.016
(dscfm)	(0.464)
(acfm)	(0.572)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>12.97	150.08	62.90
2	12.97 - 8.09	46.03	19.29
3	8.09 - 5.48	19.74	8.27
4	5.48 - 3.73	13.01	5.45
5	3.73 - 2.39	6.15	2.58
6	3.29 - 1.20	3.32	1.39
7	1.20 - 0.73	0.28	0.12
8	0.73 - 0.48	0.00	0.00
Filter	<0.48	0.00	0.00
Total Weight (mg)		238.6	

Table C-155. PARTICULATE SIZE DISTRIBUTION; BAGHOUSE I-1 ORE STORAGE RECLAIM INLET TO BAGHOUSE I-1

Run number	1
Date	01/16/80
Test time (min)	50.0
Water vapor %	1.9
Stack temperature ^oC	16
(^oF)	(60.0)
Sampling rate m^3/min	0.017
(dscfm)	(0.494)
(acfm)	(0.602)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>12.57	2.60	77.28
2	12.57 - 7.84	0.76	22.62
3	7.84 - 5.31	0.00	0
4	5.31 - 3.62	0.00	0
5	3.62 - 2.32	0.00	0
6	2.32 - 1.16	0.00	0
7	1.16 - 0.71	0.00	0
8	0.71 - 0.45	0.00	0
Filter	<0.45	0.00	0
Total Weight (mg)		3.36	

(continued)

Table C-155. (Continued)

Run number	2
Date	01/16/80
Test time (min)	50.0
Water vapor %	1.90
Stack temperature ^oC	16
(^oF)	(60.0)
Sampling rate m^3/min	0.017
(dscfm)	(0.480)
(acfm)	(0.585)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>12.75	5.24	52.24
2	12.75 - 7.96	2.01	20.81
3	7.96 - 5.39	1.19	12.32
4	5.39 - 3.67	0.37	3.83
5	3.67 - 2.35	0.44	4.55
6	2.35 - 1.17	0.17	1.76
7	1.17 - 0.72	0.10	1.04
8	0.72 - 0.46	0.08	0.83
Filter	<0.46	0.06	0.62
Total Weight (mg)		9.66	

(continued)

Table C-155. (Concluded)

Run number	3
Date	01/16/80
Test time (min)	50.0
Water vapor %	1.9
Stack temperature ^{o}C	16
(^{o}F)	(60.0)
Sampling rate m^3/min	0.016
(dscfm)	(0.474)
(acfm)	(0.578)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>12.83	10.61	66.15
2	12.83 - 8.01	1.77	11.03
3	8.01 - 5.42	1.46	9.10
4	5.42 - 3.69	0.69	4.30
5	3.69 - 2.37	0.35	2.18
6	2.37 - 1.18	0.36	2.24
7	1.18 - 0.72	0.23	1.43
8	0.72 - 0.47	0.45	2.81
Filter	<0.47	0.12	0.75
Total Weight (mg)		16.04	

Table C-156. PARTICULATE SIZE DISTRIBUTION; BAGHOUSE I-1 BAGHOUSE OUTLET

Run number	1
Date	01/16/80
Test time (min)	137.0
Water vapor %	1.60
Stack temperature °C	18
(°F)	(65.0)
Sampling rate m^3/min	0.012
(dscfm)	(0.366)
(acfm)	(0.446)

Plate no.	Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>15.75	6.84	92.06
2	15.75 - 9.83	0.26	3.50
3	9.83 - 6.66	0.00	0
4	6.66 - 4.53	0.00	0
5	4.53 - 2.90	0.00	0
6	2.90 - 1.45	0.33	4.44
7	1.45 - 0.89	0.00	0
8	0.89 - 0.59	0.00	0
Filter	<0.59	0.00	0
Total Weight (mg)		7.43	

Table C-157. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE I-1
BAGHOUSE OUTLET
(6 Minute Average)

Type of discharge	stack
Height of discharge point	30 ft
Description of sky	clear-partly cloudy
Distance from observer to point	100 ft
Date	1/15-16/80

	Run 1 test time (1155-1350; 1455-1523)	Run 2 test time (1015-1036; 1121-1247)	Run 3 test time (1413-1617)
Set no	Average opacity	Average opacity	Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	0
17	0	0	0
18	0	0	0 (2 mins)
19	0	0 (1 min)	
20	0		
21	0		
22	0		
23	0		
24	0		

Table C-158. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE I-1 CRUSHER BUILDING (6 Minute Average)

Type of discharge	fugitive
Description of sky	clear - ptly cloudy
Distance from observer to point	¼ mile
Date	1/15/80

	Run 1 test time (1154-1409)	Run 2 test time (1025-1232)	Run 3 test time (1444-1620)
Set no	Average opacity	Average opacity	Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	
17	0	0	
18	0	0	
19	0	0	
20	0	0	

Table C-159. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE I-1 CRUSHER BUILDING

Type of discharge — fugitive
Description of sky — clear-overcast
Distance from observer to point — ¼ mile

Test no.	1	2	3	Total
Date	1/15/80	1/16/80	1/16/80	
Test period	1309-1409	1025-1125	1550-1620	
Test duration (sec)	3600	3600	5400	12600
Duration of fugitive emissions (sec)	0	0	0	0
Fugitive emissions (%)	0.0	0.0	0.0	0

Table C-160. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE I-1 GRIZZLY SCREEN AREA (6 Minute Average)

Type of discharge	fugitive
Height of discharge point	12 ft
Description of sky	N/A
Distance from observer to point	20 ft
Date	1/15-16/80

Set no	Run 1 test time (1151-1517) Average opacity	Run 2 test time (1018-1237) Average opacity	Run 3 test time (1435-1612) Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	0
17	0		
18	0		
19	0		
20	0		

Table C-161. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE I-1 GRIZZLY SCREEN AREA

Type of discharge	fugitive
Height of discharge point	12 ft
Description of sky	N/A
Distance from observer to point	20 ft

Test no.	1	2	3	Total
Date	1/15/80	1/16/80	1/16/80	
Test period	1155-1255	1018-1237	1435-1612	
Test duration (sec)	3600	8340	5820	17760
Duration of fugitive emissions (sec)	12	4	1	17
Fugitive emissions (%)	0.3	0.04	0.01	0.2

Table C-162. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE I-1 CONVEYOR TRANSFER INLET (6 Minute Average)

Type of discharge	fugitive
Description of sky	N/A
Distance from observer to point	15 ft
Height of observation point	15 ft
Date	1/15-16/80

	Run 1 test time (1151-1517)	Run 2 test time (1020-1236)	Run 3 test time (1435-1612)
Set no	Average opacity	Average opacity	Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0 (2 mins)	0
17	0		0 (2 mins)
18	0		
19	0		
20	0		

Table C-163. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE I-1 CONVEYOR TRANSFER INLET

Type of discharge	fugitive
Description of sky	N/A
Distance from observer to point	15 ft
Height of observation point	15 ft

Test no.	1	2	3	Total
Date	1/15/80	1/16/80	1/16/80	
Test period	1151-1251	1020-1236	1435-1612	
Test duration (sec)	3600	5460	5820	14880
Duration of fugitive emissinns (sec)	0	0	0	0
Fugitive emissions (%)	0.0	0.0	0.0	0

Table C-164. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE I-1 SECONDARY CRUSHER INLET (6 Minute Average)

Type of discharge	fugitive
Description of sky	N/A
Date	1/15-16/80

	Run 1 test time (1155-1523)	Run 2 test time (1020-1236)	Run 3 test time (1435-1603)
Set no	Average opacity	Average opacity	Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0 (4 mins)
16	0	0 (3 mins)	
17	0		
18	0		
19	0		
20	0		

Table C-165. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE I-1 SECONDARY CRUSHER INLET

Type of discharge		fugitive		
Test no.	1	2	3	Total
Date	1/15/80	1/16/80	1/16/80	
Test period	1155-1523	1020-1236	1435-1603	
Test duration (sec)	3600	3600	3600	10800
Duration of fugitive emissions (sec)	229	203	491	923
Fugitive emissions (%)	6.4	5.6	13.6	8.5

Table C-166. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE J-1 PRIMARY CRUSHER BAGHOUSE OUTLET

Run number		1	2	3	Average
Date		6/10/74	6/11/74	6/12/74	
Test time - minutes		400	320	240	320
Production rate	Mg/hr	902.6	931.7	916.3	916.9
	(TPH)	995	1027	1010	1011
Stack Effluent					
Flow rate	m^3/min	748.5	754.8	768.6	757.3
	(acfm)	(26430)	(26653)	(27142)	(26472)
Flow rate	DNm^3/min	632.9	627.0	637.3	632.4
	(dscfm)	(22351)	(22140)	(22502)	(22331)
Temperature	°C	27.2	31.1	31.1	29.8
	(°F)	(81.0)	(88.0)	(88.0)	(85.6)
Water vapor	Vol%	2.5	3.0	3.3	2.9
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.011	0.012	0.017	0.013
(gr/dscf)		(0.005)	(0.005)	(0.007)	(0.006)
g/m^3		0.009	0.010	0.014	0.011
(gr/acf)		(0.004)	(0.004)	(0.006)	(0.005)
kg/hr		0.408	0.435	0.635	0.493
(lb/hr)		(0.90)	(0.96)	(1.4)	(1.07)
kg/Mg		0.004	0.0005	0.0006	0.0005
(lb/ton)		(0.0009)	(0.00102)	(0.00139)	(0.00111)
Total Catch					
g/DNm^3		N/A	0.0137	0.0192	0.0164
(gr/dscf)		N/A	(.00597)	(.00839)	(.00718)
g/m^3		N/A	.0113	.0159	.0136
(gr/acf)		N/A	(.00495)	(.00695)	(.00595)
kg/hr		N/A	.5125	.7348	.6236
(lb/hr)		N/A	(1.13)	(1.62)	(1.38)
kg/Mg		N/A			
(lb/ton)		N/A	(.00121)	(.00160)	(.00140)

Table C-167. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE J-1 PRIMARY IMPACT CRUSHER DISCHARGE (6 Minute Average)

Type of discharge	fugitive
Height of discharge point	6 ft
Description of background	grey wall
Description of sky	Indoors
Distance from observer to point	15 ft
Height of observation point	Ground level
Color of plume	White
Date	7/09-10/75

Set no	Run 1 Average opacity	Run 2 Average opacity
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0

Table C-168. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE J-1 PRIMARY CRUSHER BAGHOUSE OUTLET (6 Minute Average)

Type of discharge	stack
Height of discharge point	14 ft
Description of background	grey building
Description of sky	clear
Distance from observer to point	75 ft
Height of observation point	ground level
Color of plume	none
Date	6/04-05/74

Set no.	Run 1 test time (0850-0926; 1123-1141; 1212-1236) Average opacity	Set no.	Run 2 test time (0811-1141) Average opacity	Set no.	Run 2 test time (0811-1141) Average opacity
1	0	14	0	31	0
2	0	15	0	32	0
3	0	16	0	33	0
4	0	17	0	34	0
5	0	18	0	35	0
6	0	19	0	36	0
7	0	20	0	37	0
8	0	21	0	38	0
9	0	22	0	39	0
10	0	23	0	40	0
11	0	24	0	41	0
12	0	25	0	42	0
13	0	26	0	43	0
		27	0	44	0
		28	0	45	0
		29	0	46	0
		30	0	47	0
				48	0

Table C-169. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE J-2 PRIMARY CRUSHER SCREEN, BAGHOUSE OUTLET

Run number		1	2	3	Average
Date		6/10/74	6/11/74	6/12/74	
Test time - minutes		400	320	240	320
Production rate	Mg/hr	875.4	928.0	958.0	920.5
	(TPH)	965	1023	1056	1015
Stack Effluent					
Flow rate	m^3/min	447.4	446.6	449.3	447.8
	(acfm)	(15797)	(15771)	(15866)	(15811)
Flow rate	DNm^3/min	378.6	375.1	373.7	375.8
	(dscfm)	(13368)	(13246)	(13196)	(13270)
Temperature	°C	32.2	32.2	34.4	32.9
	(°F)	(90.0)	(90.0)	(94.0)	(91.3)
Water vapor	Vol%	1.4	2.1	2.5	2.0
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.004	0.004	0.005	0.005
(gr/dscf)		(0.002)	(0.002)	(0.002)	(0.002)
g/m^3		0.003	0.004	0.004	0.004
(gr/acf)		(0.001)	(0.002)	(0.002)	(0.002)
kg/hr		0.0907	0.0952	0.1134	0.0997
(lb/hr)		(0.20)	(0.21)	(0.25)	(0.22)
kg/Mg		0.00010	0.00012	0.00012	0.00011
(lb/ton)		(0.00021)	(0.00024)	(0.00024)	(0.00023)
Total Catch					
g/DNm^3		N/A	0.0054	0.0072	0.0063
(gr/dscf)		N/A	(0.00235)	(0.00314)	(0.00275)
g/m^3		N/A	0.0045	0.0060	0.0052
(gr/acf)		N/A	(0.00197)	(0.00261)	(0.00224)
kg/hr		N/A	0.1225	0.1633	0.1429
(lb/hr)		N/A	(0.27)	(0.36)	(0.32)
kg/Mg		N/A	0.00015	0.00017	0.00016
(lb/ton)		N/A	(0.00030)	(0.00034)	(0.00032)

Table C-170. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE J-2 PRIMARY CRUSHER SCREEN, BAGHOUSE OUTLET
(6 Minute Average)

Type of discharge	stack
Height of discharge point	10 ft
Description of background	sky
Description of sky	clear
Distance from observer to point	60 ft
Height of observation point	ground level
Color of plume	none
Date	6/10-11/74

	Run 1 test time (1035-1141; 1230-1436)		Run 1 test time (1035-1141; (1230-1436)		Run 2 test time (0940-1016)
Set no.	Average opacity	Set no.	Average opacity	Set no.	Average opacity
1	0	17	0	33	0
2	0	18	0	34	0
3	0	19	0	35	0
4	0	20	0	36	0
5	0	21	0	37	0
6	0	22	0	38	0
7	0	23	0		
8	0	24	0		
9	0	25	0		
10	0	26	0		
11	0	27	0		
12	0	28	0		
13	0	29	0		
14	0	30	0		
15	0	31	0		
16	0	32	0		

Table C-171. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE J-3 PRIMARY CRUSHER TRANSFER POINT, BAGHOUSE OUTLET

Run number		1	2	3	Average
Date		6/10/74	6/11/74	6/12/74	
Test time - minutes		360	288	288	312
Production rate	Mg/hr	825.5	830.0	792.0	815.8
	(TPH)	910	915	873	899
Stack Effluent					
Flow rate	m^3/min	65.2	65.5	68.5	66.4
	(acfm)	(2303)	(2313)	(2422)	(2346)
Flow rate	DNm^3/min	53.8	53.8	56.7	54.7
	(dscfm)	(1900)	(1902)	(2003)	(1935)
Temperature	°C	36.6	38.3	36.1	37
	(°F)	(98.0)	(101.0)	(97.0)	(98.7)
Water vapor	Vol%	2.4	2.4	2.3	2.4
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.002	0.004	0.005	0.004
(gr/dscf)		(0.001)	(0.002)	(0.002)	(0.002)
g/m^3		0.002	0.003	0.004	0.003
(gr/acf)		(0.001)	(0.001)	(0.002)	(0.001)
kg/hr		0.0090	0.0136	0.0181	0.0136
(lb/hr)		(0.02)	(0.03)	(0.04)	(0.03)
kg/Mg		0.00001	0.000015	0.00002	0.000015
(lb/ton)		(0.00002)	(0.00003)	(0.00004)	(0.00003)
Total Catch					
g/DNm^3		N/A	0.0043	0.0059	0.0051
(gr/dscf)		N/A	(0.00190)	(0.00259)	(0.00224)
g/m^3		N/A	0.0036	0.0049	0.0043
(gr/acf)		N/A	(0.00156)	(0.00214)	(0.00185)
kg/hr		N/A	0.0136	0.0181	0.0158
(lb/hr)		N/A	(0.03)	(0.04)	(0.035)
kg/Mg		N/A	0.000015	0.000025	0.00002
(lb/ton)		N/A	(.00003)	(.00005)	(.00004)

Table C-172. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE J-3 CONVEYOR TRANSFER POINT (6 Minute Average)

Type of discharge	fugitive
Height of discharge point	8 ft
Description of background	sky
Description of sky	partly cloudy
Distance from observer to point	50 ft
Height of observation point	6 ft
Color of plume	White
Date	7/09/75

	Run 1 test time
Set no	Average opacity
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0 (4 mins)

Table C-173. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE J-3 PRIMARY CRUSHER CONVEYOR TRANSFER POINT, BAGHOUSE OUTLET (6 Minute Average)

Type of discharge	stack
Height of discharge point	8 ft
Description of background	grey apparatus
Description of sky	clear
Distance from observer to point	60 ft
Height of observation point	8 ft
Color of plume	none
Date	6/11/74

	Run 1 test time (1040-1340)		Run 1 test time (1040-1340)		Run 2 test time (1345-1445)
Setno.	Average opacity	Set no.	Average opacity	Set no.	Average opacity
1	0	16	0	31	0
2	0	17	0	32	0
3	0	18	0	33	0
4	0	19	0	34	0
5	0	20	0	35	0
6	0	21	0	36	0
7	0	22	0	37	0
8	0	23	0	38	0
9	0	24	0	39	0
10	0	25	0	40	0
11	0	26	0		
12	0	27	0		
13	0	28	0		
14	0	29	0		
15	0	30	0		

Table C-174. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE J-4 SECONDARY SCREEN/CRUSHER BAGHOUSE OUTLET

Run number		1	2	3	Average
Date		6/06/74	6/07/74	6/08/74	
Test time - minutes		320	320	320	320
Production rate	Mg/hr	154.2	147.0	137.9	147.9
	(TPH)	170	162	152	163
Stack Effluent					
Flow rate	m^3/min	299.6	282.4	312.8	298.3
	(acfm)	(10579)	(9971)	(11045)	(10532)
Flow rate	DNm^3/min	262.7	246.7	273.5	261.0
	(dscfm)	(9277)	(8711)	(9656)	(9214)
Temperature	°C	27.2	25	26.6	26.3
	(°F)	(81.0)	(77.0)	(80.0)	(79.3)
Water vapor	Vol%	2.3	2.2	2.1	2.2
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.0008	0.002	0.002	0.002
(gr/dscf)		(0.0004)	(0.001)	(0.001)	(0.001)
g/m^3		0.001	0.002	0.002	0.001
(gr/acf)		(0.0003)	(0.001)	(0.001)	(0.001)
kg/hr		0.0136	0.0272	0.0272	0.0226
(lb/hr)		(0.03)	(0.06)	(0.06)	(0.05)
kg/Mg		0.000085	0.00017	0.0002	0.00015
(lb/ton)		(0.00017)	(0.00034)	(0.00041)	(0.00031)
Total Catch					
g/DNm^3		0.0010	0.0024		0.0017
(gr/dscf)		(0.00047)	(0.00104)		(0.00678)
g/m^3		0.0009	0.0021		0.0015
(gr/acf)		(.00041)	(0.00095)		(0.00068)
kg/hr		0.0181	0.0362		0.0272
(lb/hr)		(0.04)	(0.08)		(0.06)
kg/Mg		0.0001	0.00025		0.00017
(lb/ton)		(0.00022)	(0.00050)		(0.00034)

Table C-175. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE J-4 SECONDARY CRUSHER AND SCREEN, BAGHOUSE OUTLET (6 Minute Average)

Type of discharge	stack
Height of discharge point	15 ft
Description of background	sky
Description of sky	clear
Distance from observer to point	100 ft
Height of observation point	ground level
Color of plume	none
Date	6/06/74

	Run 1 test time (1040-1340)		Run 1 test time (1040-1340)		Run 2 test time (1345-1445)
Set no.	Average opacity	Set no.	Average opacity	Set no.	Average opacity
1	0	16	0	31	0
2	0	17	0	32	0
3	0	18	0	33	0
4	0	19	0	34	0
5	0	20	0	35	0
6	0	21	0	36	0
7	0	22	0	37	0
8	0	23	0	38	0
9	0	24	0	39	0
10	0	25	0	40	0
11	0	26	0		
12	0	27	0		
13	0	28	0		
14	0	29	0		
15	0	30	0		

Table C-176. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE K-1 PRIMARY CRUSHER BAGHOUSE INLET

Run number		1	2	3	Average
Date		10/29/74	10/30/74	10/30/74	
Test time - minutes					
Production rate	Mg/hr	293.9	325.7	340.2	320.2
	(TPH)	(324)	(359)	(375)	(353)
Stack Effluent					
Flow rate	m^3/min	121.9	130.0	129.1	127
	(acfm)	(4442)	(4790)	(4828)	(4687)
Flow rate	DNm^3/min	125.8	135.6	136.7	132.7
	(dscfm)	(4305)	(4592)	(4560)	(4486)
Temperature	°C	18	22	25	22
	(°F)	(65)	(72)	(77)	(71)
Water vapor	Vol%	2.09	2.36	2.62	2.36
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		14.18	11.65	17.42	14.42
(gr/dscf)		(6.20)	(5.09)	(7.61)	(6.30)
g/m^3		13.75	11.17	16.45	13.79
(gr/acf)		(6.01)	(4.88)	(7.19)	(6.03)
kg/hr		103.72	90.84	134.93	109.83
(lb/hr)		(228.67)	(200.28)	(297.46)	(242.13)
kg/Mg		0.352	0.278	0.396	0.342
(lb/ton)		(0.706)	(0.558)	(0.793)	(0.686)
Total Catch					
g/DNm^3		14.19	11.65	17.42	14.42
(gr/dscf)		(6.20)	(5.09)	(7.61)	(6.30)
g/m^3		13.75	11.17	16.46	13.79
(gr/acf)		(6.01)	(4.88)	(7.19)	(6.02)
kg/hr		103.74	90.86	134.94	109.85
(lb/hr)		(228.71)	(200.31)	(297.49)	(242.17)
kg/Mg		0.352	0.278	0.396	0.342
(lb/ton)		(0.706)	(.0558)	(0.793)	(0.686)

Table C-177. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE K-1 PRIMARY CRUSHER BAGHOUSE OUTLET

Run number		1	2	3	Average
Date		10/29/74	10/30/74	10/30/74	
Test time - minutes		180	120	120	140
Production rate	Mg/hr	293.9	325.7	340.2	320.2
	(TPH)	324	359	375	353
Stack Effluent					
Flow rate	m^3/min	145.9	173.3	172.1	163.7
	(acfm)	(5154)	(6121)	(6078)	(5784)
Flow rate	DNm^3/min	141.5	166.9	162.9	157.1
	(dscfm)	(4998)	(5896)	(5753)	(5549)
Temperature	°C	21.1	24.4	28.3	24.6
	(°F)	(70)	(76)	(83)	(76.3)
Water vapor	Vol%	1.8	1.87	2.06	1.91
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.021	0.002	0.023	0.016
(gr/dscf)		(0.009)	(0.001)	(0.010)	(0.007)
g/m^3		0.027	0.009	0.025	0.021
(gr/acf)		(0.012)	(0.004)	(0.011)	(0.009)
kg/hr		0.182	0.033	0.227	0.147
(lb/hr)		(0.402)	(0.072)	(0.500)	(0.325)
kg/Mg		0.0006	0.0001	0.00065	0.00045
(lb/ton)		(0.0012)	(0.0002)	(0.0013)	(0.0007)
Total Catch					
g/DNm^3		0.021	0.002	0.023	0.015
(gr/dscf)		(0.009)	(0.001)	(0.010)	(0.007)
g/m^3		0.025	0.007	0.025	0.019
(gr/acf)		(0.011)	(0.003)	(0.011)	(0.008)
kg/hr		0.2250	0.0816	0.2508	0.1858
(lb/hr)		(0.496)	(0.180)	(0.553)	(0.408)
kg/Mg		0.0008	0.00025	0.00075	0.0006
(lb/ton)		(0.0015)	(0.0005)	(0.0015)	(0.0012)

Table C-178. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE K-1 PRIMARY CRUSHER BAGHOUSE OUTLET (6 Minute Average)

Type of discharge	stack
Height of discharge point	25 ft
Description of background	grey quarry wall
Description of sky	clear - cloudy
Distance from observer to point	15 ft
Height of observation point	ground level
Color of plume	white
Date	10/29-30/80

	Run 1 test time (1030-1457)		Run 2 test time (0905-1457)		Run 2 test time (0905-1457)
Set no.	Average opacity	Set no.	Average opacity	Set no.	Average opacity
1	0	31	0	51	0
2	1	32	0	52	0
3	1	33	0	53	0
4	1	34	0	54	0
5	1	35	0	55	0
6	0	36	0	56	0
7	0	37	0	57	0
8	1	38	0	58	0
9	1	39	0	59	0
10	1	40	0	60	0
11	1	41	0	61	0
12	1	42	0	62	0
13	1	43	0	63	0
14	0	44	0	64	0
15	1	45	0	65	0
16	0	46	0	66	0
17	0	47	0	67	0
18	0	48	0	68	0
19	0	49	0	69	0
20	0	50	0		
21	0				
22	0				
23	0				
24	0				
25	0				
26	0				
27	0				
28	0				
29	0				
30	0				

Table C-179. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE K-2 SECONDARY CRUSHER BAGHOUSE OUTLET

Run number		1	2	3	Average
Date		10/31/74	10/31/74	11/11/74	
Test time - minutes		108	108	108	108
Production rate	Mg/hr	244.9	244.9	244.9	244.9
	(TPH)	270	270	270	270
Stack Effluent					
Flow rate	m^3/min	557.5	535.8	467.0	520.1
	(acfm)	(19684)	(18921)	(16487)	(18197)
Flow rate	DNm^3/min	518.4	500.0	444.0	487.5
	(dscfm)	(18296)	(17638)	(15681)	(17205)
Temperature	°C	33.3	35.5	26.1	31.6
	(°F)	(92.0)	(96.0)	(79.0)	(87.0)
Water vapor	Vol%	1.95	1.92	2.01	1.96
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.007	0.011	0.007	0.008
(gr/dscf)		(0.003)	(0.005)	(0.003)	(0.004)
g/m^3		0.007	0.011	0.007	0.008
(gr/acf)		(0.003)	(0.005)	(0.003)	(0.004)
kg/hr		0.1936	0.3415	0.2072	0.2474
(lb/hr)		(0.427)	(0.753)	(0.457)	(0.546)
kg/Mg		0.0008	0.0014	0.00085	0.0010
(lb/ton)		(0.0016)	(0.0028)	(0.0017)	(0.0020)
Total Catch					
g/DNm^3		0.014	0.014	0.016	0.014
(gr/dscf)		(0.006)	(0.006)	(0.007)	(0.006)
g/m^3		0.011	0.014	0.016	0.014
(gr/acf)		(0.005)	(0.006)	(0.007)	(0.006)
kg/hr		0.4154	0.4436	0.4331	0.4307
(lb/hr)		(0.916)	(0.978)	(0.955)	(0.946)
kg/Mg		0.0017	0.0018	0.00175	0.00175
(lb/ton)		(0.0034)	(0.0036)	(0.0035)	(0.0035)

Table C-180. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE K-2 SECONDARY CRUSHER COMPLEX, BAGHOUSE OUTLET (6 Minute Average)

Type of discharge	stack
Height of discharge point	8 ft
Description of background	sky
Description of sky	clear - partly cloudy
Distance from observer to point	30 ft
Height of observation point	5 ft
Color of plume	white
Date	10/31/74 - 11/01/74

	Run 1 test time (0927-1509)		Run 1 test time (0927-1509)		Run 2 test time (0811-0947)
Set no.	Average opacity	Set no.	Average opacity	Set no.	Average opacity
1	0	21	0	41	0
2	0	22	0	42	0
3	0	23	0	43	0
4	0	24	0	44	0
5	0	25	0	45	0
6	0	26	0	46	0
7	0	27	0	47	0
8	0	28	0	48	0
9	0	29	0	49	0
10	0	30	0	50	0
11	0	31	0	51	0
12	0	32	0	52	0
13	0	33	0	53	0
14	0	34	0	54	0
15	0	35	0	55	0
16	0	36	0	56	0
17	0	37	0		
18	0	38	0		
19	0	39	0		
20	0	40	0		

Table C-181. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE K-2 SCALPING SCREEN (6 Minute Average)

Type of discharge	fugitive
Height of discharge point	50 ft (approx.)
Description of background	hazy
Description of sky	clear (blue/gray)
Height of observation point	15 ft (approx.)
Date	6/30/75-7/01/75

Set no	Run 1 test time (0730-0919) Average opacity	Run 2 test time (0925-1131) Average opacity	Run 3 test time (0845-0937) Average opacity
1	0	2	0
2	0	1	0
3	0	2	0
4	0	4	1
5	1	1	0
6	0	2	0
7	0	2	0
8	0	2	0
9	0	1	0 (3 mins)
10	0	3	
11	0	3	
12	0	2	
13	0	3	
14	1	1	
15	0	3	
16	1	3	
17	0	2	
18	0	2	
19		1	
20		3	
21		3 (5 mins)	

Table C-182. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE K-2
HAMMER MILL
(6 Minute Average)

Type of discharge	fugitive
Height of discharge point	50 ft (approx.)
Description of background	hazy
Description of sky	clear (blue/gray)
Height of observation point	15 ft (approx.)
Date	6/30/75-7/01/75

	Run 1 test time (0730-0919)	Run 2 test time (0925-1131)	Run 3 test time (0845-0937)
Set no	Average opacity	Average opacity	Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0 (3 mins)
10	0	0	
11	0	0	
12	0	0	
13	0	0	
14	0	0	
15	0	0	
16	0	0	
17	0	0	
18	0	0	
19		0	
20		0	
21		0 (5 mins)	

Table C-183. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE K-2 SURGE BIN (6 Minute Average)

Type of discharge	fugitive
Height of discharge point	50 ft (approx.)
Description of background	hazy
Description of sky	clear (blue/gray)
Height of observation point	15 ft (approx.)
Date	6/30/75-7/01/75

	Run 1 test time (0730-0919)	Run 2 test time (0925-1131)	Run 3 test time (0845-0937)
Set no	Average opacity	Average opacity	Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0 (3 mins)
10	0	0	
11	0	0	
12	0	0	
13	0	0	
14	0	0	
15	0	0	
16	0	0	
17	0	0	
18	0	0	
19		0	
20		0	
21		0 (5 mins)	

Table C-184. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE K-2 SECONDARY CRUSHER NO. 1 (6 Minute Average)

Type of discharge	fugitive
Height of discharge point	20 ft (approx.)
Description of sky	clear
Distance from observer to point	45 ft
Height of observation point	2 ft
Color of plume	white
Date	6/30/75

Set no	Run 1 test time (0745-1145) Average opacity	Set no	Run 1 test time (0745-1145) Average opacity
1	2	21	0
2	0	22	0
3	0	23	0
4	0	24	0
5	0	25	0
6	0	26	0
7	0	27	0
8	0	28	0
9	0	29	0
10	0	30	0
11	0	31	0
12	0	32	0
13	0	33	0
14	0	34	0
15	1	35	0
16	1	36	0
17	1	37	0
18	0	38	0
19	0	39	1
20	0	40	1

Table C-185. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE K-2 SECONDARY CRUSHER NO. 2 (6 Minute Average)

Type of discharge	fugitive
Height of discharge point	20 ft (approx.)
Description of sky	clear
Distance from observer to point	45 ft
Height of observation point	2 ft
Color of plume	white
Date	6/30/75

Set no	Run 1 test time (0745-1145) Average opacity	Set no	Run 1 test time (0745-1145) Average opacity
1	0	21	0
2	0	22	0
3	0	23	0
4	0	24	0
5	0	25	0
6	0	26	0
7	0	27	0
8	0	28	0
9	0	29	0
10	0	30	0
11	0	31	0
12	0	32	0
13	0	33	0
14	0	34	0
15	0	35	0
16	0	36	0
17	0	37	0
18	0	38	0
19	0	39	0
20	0	40	0

Table C-186. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE K-2 SECONDARY CRUSHER NO. 3 (6 Minute Average)

Type of discharge	fugitive
Height of discharge point	20 ft (approx.)
Description of sky	clear
Distance from observer to point	45 ft
Height of observation point	2 ft
Color of plume	white
Date	6/30/75

	Run 1 test time (0745-1145)		Run 1 test time (0745-1145)
Set no	Average opacity	Set no	Average opacity
1	0	21	0
2	0	22	0
3	0	23	0
4	0	24	0
5	0	25	0
6	0	26	0
7	0	27	0
8	0	28	0
9	0	29	0
10	0	30	0
11	0	31	0
12	0	32	0
13	0	33	0
14	0	34	0
15	0	35	0
16	0	36	0
17	0	37	0
18	0	38	0
19	0	39	0
20	0	40	0

Table C-187. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE K-2 3 DECK FINISHING SCREEN (L) (6 Minute Average)

Type of discharge	fugitive
Height of discharge point	40 ft (approx.)
Description of background	light blue sky
Description of sky	clear
Distance from observer to point	80 ft
Height of observation point	ground level
Color of plume	white
Date	7/01/75

Set no	Run 1 test time (1000-1148) Average opacity
1	1
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	1
11	1
12	0
13	0
14	1
15	0
16	0
17	0
18	0

Table C-188. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE K-2 3 DECK FINISHING SCREEN (R) (6 Minute Average)

Type of discharge	fugitive
Height of discharge point	40 ft (approx.)
Description of background	light blue sky
Description of sky	clear
Distance from observer to point	80 ft
Height of observation point	ground level
Color of plume	white
Date	7/01/75

	Run 1 test time (1000-1148)
Set no	Average opacity
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0

Table C-189. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE L-1 SCALPING SCREEN/HAMMER MILL INLET TO BAGHOUSE

Run number		1	2	Average
Date		11/21/74	11/21/74	
Test time - minutes				
Production rate	Mg/hr (TPH)	108 (119)	115 (127)	112 (123)
Stack Effluent				
Flow rate	m^3/min (acfm)	219 (7740)	208 (7340)	214 (7540)
Flow rate	DNm^3/min (dscfm)	220 (7750)	211 (7460)	215 (7605)
Temperature	°C (°F)	2.8 (37)	5.0 (41)	3.9 (39)
Water vapor	Vol%	1.2	1.1	1.15
Particulate Emissions				
Probe and Filter Catch				
g/DNm^3 (gr/dscf)		0.002 (0.001)	5.740 (2.51)	2.871 (1.26)
g/m^3 (gr/acf)		0.002 (0.001)	5.670 (2.48)	2.836 (1.241)
kg/hr (lb/hr)		0.03 (0.07)	71.8 (158)	35.92 (79.04)
kg/Mg (lb/ton)		0.0003 (0.0006)	0.62 (1.2)	0.3102 (0.6003)

Table C-190. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE L-1 PRIMARY CRUSHER INLET TO BAGHOUSE

Run number		1	2	Average
Date		11/21/74	11/22/74	
Test time - minutes				
Production rate	Mg/hr (TPH)	108 (119)	115 (127)	112 (123)
Flow rate	m^3/min (acfm)	31.4 (1110)	31.1 (1100)	31.3 (1105)
Flow rate	DNm^3/min (dscfm)	31.4 (1110)	31.7 (1120)	31.6 (1115)
Temperature	°C (°F)	4.4 (40)	5.6 (42)	5.0 (41)
Water vapor	Vol%	0.6	0.6	0.6
Particulate Emissions				
Probe and Filter Catch				
g/DNm^3 (gr/dscf)		0.434 (0.190)	0.556 (0.239)	0.495 (0.215)
g/m^3 (gr/acf)		0.435 (0.190)	0.546 (0.243)	0.491 (0.217)
kg/hr (lb/hr)		0.82 (1.8)	1.0 (2.3)	0.91 (2.1)
kg/Mg (lb/ton)		0.008 (0.02)	0.009 (0.02)	0.009 (0.02)

Table C-191. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE L-1
PRIMARY CRUSHER, SCALPING SCREEN, AND HAMMERMILL; BAGHOUSE OUTLET

Run number		1	2	3	Average
Date		11/19/74	11/21/74	11/22/74	
Test time - minutes		120	240	240	200
Production rate TPH		132	119	127	126
Stack Effluent					
Flow rate	m^3/min	208	214	213	212
	(acfm)	(7340)	(7560)	(7520)	(7473)
Flow rate	DNm^3/min	206	219	221	215
	(dscfm)	(7260)	(7720)	(7800)	(7593)
Temperature	°C	18.8	3.3	6.6	
	(°F)	(66.0)	(38.0)	(44.0)	(49.3)
Water vapor	Vol%	1.0	0.4	0.1	0.5
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.007	0.002	0.007	0.005
(gr/dscf)		(0.003)	(0.001)	(0.003)	(0.002)
g/m^3		0.007	0.0001	0.007	0.005
(gr/acf)		(0.003)	(0.0001)	(0.003)	(0.002)
kg/hr		0.0816	0.0226	0.0771	0.0604
(lb/hr)		(0.18)	(0.05)	(0.17)	(0.10)
kg/Mg		0.0005	0.0002	0.0005	0.0004
(lb/ton)		(0.001)	(0.0004)	(0.001)	(0.0008)
Total Catch					
g/DNm^3		0.016	0.002	0.007	0.008
(gr/dscf)		(0.007)	(0.001)	(0.003)	(0.004)
g/m^3		0.016	0.002	0.007	0.008
(gr/acf)		(0.007)	(0.001)	(0.003)	(0.004)
kg/hr		0.1950	0.0408	0.0952	0.1103
(lb/hr)		(0.43)	(0.09)	(0.21)	(0.24)
kg/Mg		0.0015	0.0004	0.001	0.001
(lb/ton)		(0.003)	(0.0008)	(0.002)	(0.0019)

Table C-192. SUMMARY OF VISIBLE EMISSIONS BAGHOUSE L-1; PRIMARY CRUSHER AND HAMMER MILL (6 Minute Average)

Type of discharge	stack
Height of discharge point	40 ft
Description of background	trees
Description of sky	overcast
Distance from observer to point	100 ft
Height of observation point	50 ft
Color of plume	white
Date	11/22/74

Set no.	Run 1 test time (1210-1610) Average opacity	Set no.	Run 1 test time (1210-1610) Average opacity	Set no.	Run 1 test time (1210-1610) Average opacity
1	0	14	0	27	0
2	0	15	0	28	0
3	0	16	0	29	0
4	0	17	0	30	0
5	0	18	0	31	0
6	0	19	0	32	0
7	0	20	0	33	0
8	0	21	0	34	0
9	0	22	0	35	0
10	0	23	0	36	0
11	0	24	0	37	0
12	0	25	0	38	0
13	0	26	0	39	0
				40	0

Table C-193. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE L-2 SIZING SCREENS, CONVEYOR TRANSFER POINTS; BAGHOUSE INLET

Run number		1	2	Average
Date		11/21/74	11/22/74	
Test time - minutes				
Production rate	Mg/hr	108	115	112
	(TPH)	(119)	(127)	(123)
Stack Effluent				
Flow rate	m^3/min	337	275	306
	(acfm)	(11900)	(9710)	(10805)
Flow rate	DNm^3/min	334	277	306
	(dscfm)	(11800)	(9790)	(10795)
Temperature	°C	7.2	7.2	7.2
	(°F)	(45)	(45)	(45)
Water vapor	Vol%	0.3	0.8	0.6
Particulate Emissions				
Probe and Filter Catch				
g/DNm^3		0.165	0.714	0.440
(gr/dscf)		(0.072)	(0.312)	(0.192)
g/m^3		0.163	0.717	0.440
(gr/acf)		(0.071)	(0.313)	(0.192)
kg/hr		3.3	11.9	7.6
(lb/hr)		(7.3)	(26.2)	(16.8)
kg/Mg		0.03	0.10	0.07
(lb/ton)		(0.06)	(0.21)	(0.14)

Table C-194. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE L-2 SIZING SCREENS, CONVEYOR TRANSFER POINTS; BAGHOUSE OUTLET

Run number		1	2	3	Average
Date		11/19/74	11/21/74	11/22/74	
Test time - minutes		120	240	240	200
Production rate	Mg/hr	119.8	108	115.2	114.3
	(TPH)	132	119	127	126
Stack Effluent					
Flow rate	m^3/min	176.2	195.0	185.2	185.5
	(acfm)	(6220)	(6870)	(6540)	(6543)
Flow rate	DNm^3/min	177.3	194.8	189.7	187.3
	(dscfm)	(6260)	(6880)	(6700)	(6613)
Temperature	°C	16.6	10	10.5	12.4
	(°F)	(62.0)	(50.0)	(51.0)	(54.3)
Water vapor	Vol%	0.4	0.3	0.1	0.27
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.014	0.0001	0.001	0.005
(gr/dscf)		(0.006)	(0.00003)	(0.0004)	(0.002)
g/m^3		0.014	0.0001	0.001	0.005
(gr/acf)		(0.006)	(0.00003)	(0.0004)	(0.002)
kg/hr		0.1406	0.0009	0.009	0.0502
(lb/hr)		(0.31)	(0.002)	(0.02)	(0.111)
kg/Mg		0.001	0.00001	0.0001	0.00037
(lb/ton)		(0.002)	(0.00002)	(0.0002)	(0.00074)
Total Catch					
g/DNm^3		0.018	0.001	0.002	0.007
(gr/dscf)		(0.008)	(0.001)	(0.001)	(0.003)
g/m^3		0.021	0.002	0.002	0.008
(gr/acf)		(0.009)	(0.001)	(0.001)	(0.006)
kg/hr		0.2086	0.0181	0.0227	0.0831
(lb/hr)		(0.46)	(0.04)	(0.05)	(0.18)
kg/Mg		0.0015	0.00015	0.0002	0.00062
(lb/ton)		(0.003)	(0.0003)	(0.0004)	(0.0012)

Table C-195. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE L-2 SCREENS AND CONVEYOR TRANSFER POINTS, BAGHOUSE OUTLET (6 Minute Average)

Type of discharge	stack
Height of discharge point	40 ft
Description of background	trees
Description of sky	overcast
Distance from observer to point	200 ft
Height of observation point	50 ft
Color of plume	white
Date	11/27/74

Set no	Run 1 test time (1210-1610) Average opacity	Set no	Run 1 test time (1210-1610) Average opacity
1	0	21	0
2	0	22	0
3	0	23	0
4	0	24	0
5	0	25	0
6	0	26	0
7	0	27	0
8	0	28	0
9	0	29	0
10	0	30	0
11	0	31	0
12	0	32	0
13	0	33	0
14	0	34	0
15	0	35	0
16	0	36	0
17	0	37	0
18	0	38	0
19	0	39	0
20	0	40	0

Table C-196. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE M-1
SECONDARY TERTIARY CRUSHERS AND ASSOCIATED SCREENS; BAGHOUSE OUTLET

Run number		1	2	3	Average
Date		9/17/74	9/18/74	9/19/74	
Test time - minutes		240	240	240	240
Production rate	Mg/hr	204.1	208.6	199.6	204.1
	(TPH)	225	230	220	225
Stack Effluent					
Flow rate	m^3/min	901.4	900.8	904.8	902.3
	(acfm)	(31830)	(31810)	(31950)	(31863)
Flow rate	DNm^3/min	888.4	868.0	884.4	880.3
	(dscfm)	(31370)	(30650)	(31230)	(31083)
Temperature	°C	18.8	21.6	20.0	20.1
	(°F)	(66.0)	(71.0)	(68.0)	(68.3)
Water vapor	Vol%	1.2	1.7	1.6	1.5
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.022	0.019	0.018	0.019
(gr/dscf)		(0.010)	(0.008)	(0.008)	(0.009)
g/m^3		0.022	0.018	0.018	0.019
(gr/acf)		(0.009)	(0.008)	(0.008)	(0.008)
kg/hr		1.16	.9661	.9661	1.03
(lb/hr)		(2.55)	(2.13)	(2.13)	(2.27)
kg/Mg		0.0057	0.0047	0.0049	0.0050
(lb/ton)		(0.0113)	(0.0093)	(0.0097)	(00.101)
Total Catch					
g/DNm^3		0.023	0.019	0.020	0.021
(gr/dscf)		(0.010)	(0.009)	(0.009)	(0.009)
g/m^3		0.022	0.019	0.019	0.020
(gr/acf)		(0.010)	(0.008)	(0.008)	(0.009)
kg/hr		1.22	1.01	1.04	1.09
(lb/hr)		(2.69)	(2.23)	(2.30)	(2.41)
kg/Mg		0.0060	0.0049	0.0053	0.0054
(lb/ton)		(0.0120)	(0.0097)	(0.0105)	(0.0107)

Table C-197. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE M-1 SECONDARY AND TERTIARY CRUSHERS AND SCREENS, BAGHOUSE OUTLET (6 Minute Average)

Type of discharge	stack
Height of discharge point	55 ft
Description of background	trees
Description of sky	partly cloudy
Distance from observer to point	300 ft
Height of observation point	40 ft
Color of plume	none
Date	9/17/74

	Run 1 test time (0910-1300)		Run 1 test time (0910-1300)
Set no	Average opacity	Set no	Average opacity
1	0	21	0
2	0	22	0
3	0	23	0
4	0	24	0
5	0	25	0
6	0	26	0
7	0	27	0
8	0	28	0
9	0	29	0
10	0	30	0
11	0	31	0
12	0	32	0
13	0	33	0
14	0	34	0
15	0	35	0
16	0	36	0
17	0	37	0
18	0	38	0
19	0	39	0
20	0	40	0

Table C-198. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE M-1 NO. 1 TERTIARY GYRASPHERE CONE CRUSHER (6 Minute Average)

Type of discharge	fugitive
Description of background	machinery
Description of sky	overcast
Distance from observer to point	30 ft
Height of observation point	ground level
Color of plume	white
Date	7/08/75

Set no	Run 1 Average opacity	Set no	Run 1 Average opacity
1	0	16	0
2	0	17	0
3	0	18	0
4	0	19	0
5	0	20	0
6	0	21	0
7	0	22	0
8	0	23	0
9	0	24	0
10	0	25	0
11	0	26	0
12	0	27	0
13	0	28	0
14	0	29	0 (2 mins)
15	0		

Table C-199. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE M-1 NO. 2 TERTIARY GYRASPHERE CONE CRUSHER (6 Minute Average)

Type of discharge	fugitive
Description of background	machinery
Description of sky	overcast
Distance from observer to point	30 ft
Color of plume	white
Date	7/08/75

Set no	Run 1 Average opacity	Set no	Run 1 Average opacity
1	0	16	0
2	0	17	0
3	0	18	0
4	0	19	0
5	0	20	0
6	0	21	0
7	0	22	0
8	0	23	0
9	0	24	0
10	0	25	0
11	0	26	0
12	0	27	0
13	0	28	0
14	0	29	0 (2 mins)
15	0		

Table C-200. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE M-1 SECONDARY STANDARD CONE CRUSHER (6 Minute Average)

Type of discharge	fugitive
Description of background	machinery
Description of sky	overcast
Distance from observer to point	30 ft
Color of plume	white
Date	7/08/75

Set no	Run 1 Average opacity	Set no	Run 1 Average opacity
1	0	16	0
2	0	17	0
3	0	18	0
4	0	19	0
5	0	20	0
6	0	21	0
7	0	22	0
8	0	23	0
9	0	24	0
10	0	25	0
11	0	26	0
12	0	27	0
13	0	28	0
14	0	29	0 (2 mins)
15	0		

Table C-201. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE M-1 SCALPING SCREEN (6 Minute Average)

Type of discharge	fugitive
Description of background	equipment
Description of sky	overcast
Distance from observer to point	30 ft
Height of observation point	15 ft
Color of plume	white

	Run 1		Run 1
Set no	Average opacity	Set no	Average opacity
1	0	19	0
2	0	20	0
3	0	21	0
4	0	22	0
5	0	23	0
6	0	24	0
7	0	25	0
8	0	26	0
9	0	27	0
10	0	28	0
11	0	29	0
12	0	30	0
13	0	31	0
14	0	32	0
15	0	33	0
16	0	34	0
17	0	35	0
18	0		

Table C-202. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE M-1 SECONDARY (2-DECK) SIZING SCREEN (6 Minute Average)

Type of discharge	fugitive
Description of background	equipment
Description of sky	overcast
Distance from observer to point	30 ft
Height of observation point	15 ft
Color of plume	white
Date	7/09/75

	Run 1		Run 1
Set no	Average opacity	Set no	Average opacity
1	0	19	0
2	0	20	0
3	0	21	0
4	0	22	0
5	0	23	0
6	0	24	0
7	0	25	0
8	0	26	0
9	0	27	0
10	0	28	0
11	0	29	0
12	0	30	0
13	0	31	0
14	0	32	0
15	0	33	0
16	0	34	0
17	0	35	0
18	0		

Table C-203. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE M-1 SECONDARY (3-DECK) SIZING SCREEN (6 Minute Average)

Type of discharge	fugitive
Description of background	equipment
Description of sky	overcast
Distance from observer to point	30 ft
Height of observation point	15 ft
Color of plume	white
Date	7/09/75

Set no	Run 1 Average opacity	Set no	Run 1 Average opacity
1	0	19	0
2	0	20	0
3	0	21	0
4	0	22	0
5	0	23	0
6	0	24	0
7	0	25	0
8	0	26	0
9	0	27	0
10	0	28	0
11	0	29	0
12	0	30	0
13	0	31	0
14	0	32	0
15	0	33	0
16	0	34	0
17	0	35	0
18	0		

Table C-204. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE M-2 FINAL SIZING SCREENS AND ASSOCIATED TRANSFER AND DISCHARGE POINTS BAGHOUSE OUTLET

Run number		1	2	3	Average
Date		9/17/74	9/18/74	9/19/74	
Test time - minutes		240	240	240	240
Production rate	Mg/hr	204.1	208.6	199.6	204.1
	(TPH)	225	230	220	225
Stack Effluent					
Flow rate	m^3/min	758.7	743.7	703.2	735.2
	(acfm)	(26790)	(26260)	(24830)	(25960)
Flow rate	DNm^3/min	742.0	714.5	684.5	713.6
	(dscfm)	(26700)	(25230)	(24170)	(25200)
Temperature	°C	20.5	23.3	22.2	22.1
	(°F)	(69.0)	(74.0)	(72.0)	(71.7)
Water vapor	Vol%	1.3	1.6	1.3	1.4
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.006	0.009	0.005	0.007
(gr/dscf)		(0.003)	(0.004)	(0.002)	(0.003)
g/m^3		0.006	0.008	0.005	0.006
(gr/acf)		(0.003)	(0.004)	(0.002)	(0.003)
kg/hr		0.2767	0.3720	0.2132	0.2857
(lb/hr)		(0.61)	(0.82)	(0.47)	(0.63)
kg/Mg		0.0014	0.0018	0.0010	0.0014
(lb/ton)		(0.0027)	(0.0036)	(0.0021)	(0.0028)
Total Catch					
g/DNm^3		0.009	0.010	0.007	0.009
(gr/dscf)		(0.004)	(0.005)	(0.003)	(0.004)
g/m^3		0.009	0.010	0.007	0.009
(gr/acf)		(0.0040)	(0.0043)	(0.003)	(0.004)
kg/hr		0.4128	0.4445	0.2903	0.3810
(lb/hr)		(0.91)	(0.98)	(0.64)	(0.84)
kg/Mg		0.0020	0.0022	0.0015	0.0019
(lb/ton)		(0.0040)	(0.0043)	(0.0029)	(0.0037)

Table C-205. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE M-2 FINAL SIZING SCREENS AND TRANSFER POINTS BAGHOUSE OUTLET (6 Minute Average)

Type of discharge	stack
Height of discharge point	55 ft
Description of background	trees
Description of sky	clear
Distance from observer to point	300 ft
Height of observation point	40 ft
Color of plume	none
Date	9/18/74

	Run 1 test time (0830-1230)		Run 1 test time (0830-1230)
Set no	Average opacity	Set no	Average opacity
1	0	21	0
2	0	22	0
3	0	23	0
4	0	24	0
5	0	25	0
6	0	26	0
7	0	27	0
8	0	28	0
9	0	29	0
10	0	30	0
11	0	31	0
12	0	32	0
13	0	33	0
14	0	34	0
15	0	35	0
16	0	36	0
17	0	37	0
18	0	38	0
19	0	39	0
20	0	40	0

Table C-206. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE N-1 TERTIARY CRUSHERS, ASSOCIATED SCREENS AND TRANSFER POINTS; BAGHOUSE OUTLET

Run number		1	2	3	Average
Date		11/18/74	11/18/74	11/19/74	
Test time - minutes		120	120	120	120
Production rate	Mg/hr	348.4	310.3	417.3	358.3
	(TPH)	384	342	460	395
Stack Effluent					
Flow rate	m^3/min	432.5	396.4	424.1	417.6
	(acfm)	(15272)	(13997)	(14975)	(14748)
Flow rate	DNm^3/min	461.5	419.0	443.0	441.2
	(dscfm)	(16297)	(14796)	(15642)	(15578)
Temperature	°C	.61	4.6	5	3.4
	(°F)	(33.1)	(40.4)	(41.0)	(38.2)
Water vapor	Vol%	0.5	0.0	0.5	0.3
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.031	0.027	0.034	0.030
(gr/dscf)		(0.013)	(0.012)	(0.015)	(0.013)
g/m^3		0.033	0.028	0.035	0.032
(gr/acf)		(0.014)	(0.012)	(0.015)	(0.014)
kg/hr		0.8482	0.6668	0.8935	0.8209
(lb/hr)		(1.87)	(1.47)	(1.97)	(1.77)
kg/Mg		0.0025	0.0022	0.0022	0.0023
(lb/ton)		(0.0049)	(0.0043)	(0.0043)	(0.0045)
Total Catch					
g/DNm^3		0.039	0.031	0.038	0.036
(gr/dscf)		(0.0170)	(0.0137)	(0.0164)	(0.0157)
g/m^3		0.041	0.033	0.039	0.038
(gr/acf)		(0.018)	(0.015)	(0.017)	(0.017)
kg/hr		1.08	0.7892	0.9979	0.9525
(lb/hr)		(2.37)	(1.74)	(2.20)	(2.10)
kg/Mg		0.0034	0.0026	0.0024	0.0028
(lb/ton)		(0.0067)	(0.0051)	(0.0048)	(0.0055)

Table C-207. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE N-1 TERTIARY CRUSHERS AND SCREENS, BAGHOUSE OUTLET

(6 Minute Average)

Type of discharge	stack
Height of discharge point	½ ft
Description of background	gray wall
Description of sky	overcast
Distance from observer to point	60 ft
Height of observation point	ground level
Color of plume	none
Date	11/18-19/74

	Run 1 test time (0900-1000; 1015-1115)		Run 2 test time (1007-1107)
Set no	Average opacity	Set no	Average opacity
1	0	21	0
2	0	22	0
3	0	23	0
4	0	24	0
5	0	25	0
6	0	26	0
7	0	27	0
8	0	28	0
9	0	29	0
10	0	30	0
11	0		
12	0		
13	0		
14	0		
15	0		
16	0		
17	0		
18	0		
19	0		
20	0		

Table C-208. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE N-2 FINISHING SCREENS AND CONVEYOR TRANSFER POINTS; BAGHOUSE OUTLET

Run number		1	2	3	Average
Date		11/18/74	11/18/74	11/19/74	
Test time - minutes		120	120	120	120
Production rate	Mg/hr	348.4	310.3	417.3	358.3
	(TPH)	384	342	460	395
Stack Effluent					
Flow rate	m^3/min	627.8	559.9	606.8	598.2
	(acfm)	(22169)	(19772)	(21426)	(21122)
Flow rate	DNm^3/min	651.4	564.4	616.8	610.9
	(dscfm)	(23001)	(19930)	(21779)	(21570)
Temperature	°C	6.9	15.1	12.7	11.6
	(°F)	(44.5)	(59.2)	(55.0)	(52.9)
Water vapor	Vol%	1.1	1.1	0.6	0.9
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.030	0.022	0.035	0.029
(gr/dscf)		(0.013)	(0.010)	(0.015)	(0.013)
g/m^3		0.031	0.022	0.035	0.030
(gr/acf)		(0.014)	(0.010)	(0.016)	(0.013)
kg/hr		1.18	0.75	1.29	1.08
(lb/hr)		(2.60)	(1.65)	(2.85)	(2.37)
kg/Mg		0.0034	0.0024	0.0031	0.0030
(lb/ton)		(0.0068)	(0.0048)	(0.0062)	(0.0059)
Total Catch					
g/DNm^3		0.047	0.315	0.039	0.039
(gr/dscf)		(0.021)	(0.138)	(0.017)	(0.017)
g/m^3		0.049	0.032	0.040	0.040
(gr/acf)		(0.21)	(0.014)	(0.017)	(0.018)
kg/hr		1.84	1.07	1.44	1.45
(lb/hr)		(4.05)	(2.35)	(3.18)	(3.19)
kg/Mg		0.0053	0.0035	0.0035	0.0041
(lb/ton)		(0.0105)	(0.0069)	(0.0069)	(0.0081)

Table C-209. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE N-2 FINISHING SCREENS AND CONVEYOR TRANSFER POINTS, BAGHOUSE OUTLET
(6 Minute Average)

Type of discharge	stack
Height of discharge point	½ ft
Description of background	hillside
Description of sky	clear
Distance from observer to point	120 ft
Height of observation point	ground level
Color of plume	none
Date	11/18-19/74

	Run 1 test time (1250-1400)		Run 2 test time (0905-1005)
Set no	Average opacity	Set no	Average opacity
1	0	21	0
2	0	22	0
3	0	23	0
4	0	24	0
5	0	25	0
6	0	26	0
7	0	27	0
8	0	28	0
9	0	29	0
10	0	30	0
11	0		
12	0		
13	0		
14	0		
15	0		
16	0		
17	0		
18	0		
19	0		
20	0		

Table C-210. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE O-1 #2 PEBBLE MILL BAGHOUSE, NORTH INLET

Run number		1
Date		9/28/76
Test time - minutes		
Stack Effluent		
Flow rate	m^3/min (acfm)	43 (1520)
Flow rate	DNm^3/min (dscfm)	36 (1260)
Temperature	°C (°F)	39 (103)
Water vapor	Vol%	
Particulate Emissions		
Probe and Filter Catch		
g/DNm^3 (gr/dscf)		29.6 (12.9)
g/m^3 (gr/acf)		24.6 (10.7)
kg/hr (lb/hr)		63.5 (140)
Total Catch		
g/DNm^3 (gr/dscf)		29.6 (12.9)
g/m^3 (gr/acf)		24.6 (10.7)
kg/hr (lb/hr)		63.5 (140)

Table C-211. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE O-1 #2 PEBBLE MILL BAGHOUSE, SOUTH INLET

Run number		1
Date		9/28/76
Test time - minutes		
Stack Effluent		
Flow rate	m^3/min (acfm)	59 (2070)
Flow rate	DNm^3/min (dscfm)	49 (1720)
Temperature	°C (°F)	39 (103)
Water vapor	Vol%	
Particulate Emissions		
Probe and Filter Catch		
g/DNm^3 (gr/dscf)		2.260 (0.989)
g/m^3 (gr/acf)		1.880 (0.823)
kg/hr (lb/hr)		6.61 (14.6)
Total Catch		
g/DNm^3 (gr/dscf)		2.260 (0.989)
g/m^3 (gr/acf)		1.880 (0.823)
kg/hr (lb/hr)		6.61 (14.6)

Table C-212. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE O-1
#2 PEBBLE MILL BAGHOUSE OUTLET

Run number		1	2	3	Average
Date		9/28/76	9/28/76	9/29/76	
Test time - minutes		120	120	120	120
Stack Effluent					
Flow rate	m^3/min	143.6	136.8	126.6	135.6
	(acfm)	(5070)	(4830)	(4470)	(4790)
Flow rate	DNm^3/min	119.2	111.5	105.4	112.1
	(dscfm)	(4210)	(3940)	(3720)	(3960)
Temperature	°C	40.5	46.1	39.4	42.2
	(°F)	(105)	(115)	(103)	(108)
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.011	0.011	0.009	0.011
(gr/dscf)		(0.005)	(0.005)	(0.004)	(0.005)
g/m^3		0.009	0.009	0.009	0.009
(gr/acf)		(0.004)	(0.004)	(0.004)	(0.004)
kg/hr		0.0771	0.0816	0.0635	0.0725
(lb/hr)		(0.17)	(0.18)	(0.14)	(0.16)
Total Catch					
g/DNm^3		0.011	0.011	0.009	0.011
(gr/dscf)		(0.005)	(0.005)	(0.004)	(0.005)
g/m^3		0.009	0.009	0.009	0.009
(gr/acf)		(0.004)	(0.004)	(0.004)	(0.004)
kg/hr		0.0771	0.0816	0.0635	0.0725
(lb/hr)		(0.17)	(0.18)	(0.14)	(0.16)

Table C-213. PARTICULATE SIZE DISTRIBUTION; BAGHOUSE O-1 PEBBLE MILL BAGHOUSE NORTH INLET

Date	09/28/76
Stack temperature °C	39
(°F)	(102)

Plate no.	Diameter (micrometers)	Weight (grams)	Percent per plate
1	≥45.0	11.4	34.2
2	45.0 - 30.0	4.2	12.5
3	30.0 - 20.0	3.3	10.0
4	20.0 - 10.0	7.8	23.5
5	10.0 - 8.0	0.2	0.4
6	8.0 - 6.3	0.4	1.2
7	6.3 - 5.0	0.7	2.1
8	5.0 - 4.0	0.6	2.0
9	4.0 - 3.2	0.8	2.5
10	3.2 - 2.5	1.0	3.1
11	2.5 - 2.0	0.9	2.7
12	2.0 - 1.6	0.6	1.9
13	1.6 - 1.3	0.4	1.1
14	1.3 - 1.0	0.4	1.2
15	1.0 - 0.5	0.4	1.2
Filter	<0.5	0.1	0.4
Total Weight (g)		33.3	

Table C-214. PARTICULATE SIZE DISTRIBUTION; BAGHOUSE O-1
PEBBLE MILL BAGHOUSE SOUTH INLET

Date	09/28/76
Stack temperature °C	39
(°F)	(102)

Plate no.	Diameter (micrometers)	Weight (grams)	Percent per plate
1	≥45	0.4	25.7
2	45 - 30	0.3	19.1
3	30 - 20	0.2	16.4
4	20 - 10	0.1	9.9
5	10 - 50	0.1	6.6
6	5.0 - 4.0	0.006	0.4
7	4.0 - 3.2	0.02	1.1
8	3.2 - 2.5	0.03	2.1
9	2.5 - 2.0	0.04	2.8
10	2.0 - 1.6	0.04	3.1
11	1.6 - 1.3	0.04	2.5
12	1.3 - 1.0	0.03	2.4
13	1.0 - 0.5	0.07	5.1
Filter	<0.5	0.04	2.8
Total Weight (g)		1.423	

Table C-215. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE O-1
#2 PEBBLE MILL, BUCKET ELEVATOR, TRANSFER POINTS, PRODUCT LOADOUT, BAGHOUSE OUTLET
(6 Minute Average)

Type of discharge	stack
Height of discharge point	100 ft
Description of background	trees
Description of sky	overcast
Distance from observer to point	40 ft
Height of observation point	100 ft
Color of plume	none
Date	9/28-29/76

	Run 1	Run 2	Run 3
	test time	test time	test time
	(0948-1206)	(1448-1700)	(0835-1037)
Set no	Average opacity	Average opacity	Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	0
17	0	0	0
18	0	0	0
19	0	0	0
20	0	0	0
21	0	0	0 (3 mins)
22	0		
23	0		

Table C-216. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE O-1 BALL MILL (FEED END) (6 Minute Average)

Type of discharge	fugitive
Height of discharge point	20 ft
Description of background	building and equipment
Distance from observer to point	35 ft
Color of plume	not visible
Date	9/28/76

	Run 1
Set no	Average opacity
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0

Table C-217. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE O-1 BALL MILL (DISCHARGE END) (6 Minute Average)

Type of discharge	fugitive
Height of discharge point	20 ft
Description of background	building and equipment
Distance from observer to point	35 ft
Color of plume	not visible
Date	9/28/76

	Run 1
Set no	Average opacity
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0

Table C-218. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE O-1 INDOOR TRANSFER POINT NO. 1 (6 Minute Average)

Type of discharge	fugitive
Height of discharge point	variable
Description of background	building wall
Description of sky	N/A
Distance from observer to point	6 ft - 35 ft
Color of plume	not visible
Date	9/28/76

	Run 1 test time (1600-1700)
Set no	Average opacity
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0

Table C-219. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE O-1 INDOOR TRANSFER POINT NO. 2 (6 Minute Average)

Type of discharge	fugitive
Height of discharge point	variable
Description of background	building wall
Description of sky	N/A
Distance from observer to point	6 ft - 35 ft
Color of plume	not visible
Date	9/28/76

Set no	Run 1 test time (1500-1600) Average opacity
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0

Table C-220. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE O-1 TRUCK LOADING (6 Minute Average)

Type of discharge	fugitive
Height of discharge point	15 ft
Description of background	building wall
Description of sky	cloudy
Distance from observer to point	30 ft
Color of plume	not visible
Date	9/28/76

	Run 1 test time (0903-0915)
Set no	Average opacity
1	0
2	0

Table C-221. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE O-1
RAILROAD CAR LOADING
(6 Minute Average)

Type of discharge	fugitive
Height of discharge point	15 ft
Description of background	building wall
Description of sky	cloudy
Distance from observer to point	25 ft
Height of observation point	ground level
Date	9/28/76

	Run 1 test time (1209-1239)
Set no	Average opacity
1	0
2	0
3	1
4	1
5	2

Table C-222. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE P-1 RAYMOND IMPACT MILL BAGHOUSE INLET

Run number		1
Date		12/06/78
Test time - minutes		60
Stack Effluent		
Flow rate	m^3/min (acfm)	486.5 (17180)
Flow rate	DNm^3/min (dscfm)	397.6 (14040)
Temperature	°C (°F)	57.7 (136)
Water vapor	Vol%	7.4
Particulate Emissions		
Probe and Filter Catch		
g/DNm^3 (gr/dscf)		10.36 (4.53)
g/m^3 (gr/acf)		8.46 (3.70)
kg/hr (lb/hr)		247.2 (545)

Table C-223. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE P-1
RAYMOND IMPACT MILL BAGHOUSE OUTLET

Run number		1	2	3	Average
Date		12/06/78	12/06/78	12/06/78	
Test time - minutes		96	96	96	96
Stack Effluent					
Flow rate	m^3/min (acfm)	501 (17690)	509 (17960)	511 (18060)	507 (17903)
Flow rate	DNm^3/min (dscfm)	419 (14790)	415 (14650)	427 (15080)	420 (14840)
Temperature	°C (°F)	55 (131)	61 (141)	61 (141)	59 (138)
Water vapor	Vol%	7.0	7.8	5.4	6.7
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3 (gr/dscf)		0.046 (0.020)	0.027 (0.012)	0.037 (0.016)	0.037 (0.016)
g/m^3 (gr/acf)		0.039 (0.017)	0.023 (0.010)	0.030 (0.013)	0.030 (0.013)
kg/hr (lb/hr)		1.13 (2.49)	0.70 (1.54)	0.91 (2.01)	0.91 (2.01)

Table C-224. PARTICULATE SIZE DISTRIBUTION; BAGHOUSE P-1 #8 RAYMOND IMPACT MILL BAGHOUSE INLET

Run number	
Date	12/06/78
Test time (min)	5
Water vapor %	8
Stack temperature °C	57
(°F)	(135)
Sampling rate m^3/min	0.017
(acfm)	(.59)
Volume of sample, cf	2.946

Plate no.	Effective Aerodynamic Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	$\geq$13.1	35.1	10.1
2	8.1	45.9	13.2
3	5.5	124.9	35.8
4	3.8	97.3	27.9
5	2.4	30.9	8.0
6	1.2	12.3	3.5
7	0.7	2.1	0.0
Filter		0.0	0.0
Total Weight (mg)		348.5	

Table C-225. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE P-1 RAYMOND IMPACT MILL, BAGHOUSE OUTLET (6 Minute Average)

Type of discharge	stack
Height of discharge point	80 ft
Description of background	trees
Description of sky	blue
Distance from observer to point	7 ft
Height of observation point	80 ft
Color of plume	white
Date	12/06/78

Set no	Run 1 test time (1400-1530) Average opacity
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0

Table C-226. SUMMARY OF EMISSION TEST RESULTS
BAGHOUSE P-2
ROLLER MILL BAGHOUSE INLET

Run number		1
Date		12/06/78
Test time - minutes		56
Stack Effluent		
Flow rate	m^3/min (acfm)	242 (8550)
Flow rate	DNm^3/min (dscfm)	197 (6960)
Temperature	°C (°F)	57 (134)
Water vapor	Vol%	7.9
Particulate Emissions		
Probe and Filter Catch		
g/DNm^3 (gr/dscf)		4.03 (1.76)
g/m^3 (gr/acf)		3.27 (1.43)
kg/hr (lb/hr)		48 (105)

Table C-227. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE P-2 ROLLER MILL BAGHOUSE OUTLET

Run number		1	2	3	Average
Date		12/05/78	12/05/78	12/06/78	
Test time - minutes		120	120	120	120
Stack Effluent					
Flow rate	m^3/min	277.0	278.4	292.8	282.7
	(acfm)	(9780)	(9830)	(10340)	(9983)
Flow rate	DNm^3/min	230.0	230.8	242.4	234.4
	(dscfm)	(8120)	(8150)	(8560)	(8277)
Temperature	°C	53.8	50.5	57.7	53.8
	(°F)	129	123	136	129
Water vapor	Vol%	8.4	9.4	6.7	8.2
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.023	0.011	0.016	0.016
(gr/dscf)		(0.010)	(0.005)	(0.007)	(0.007)
g/m^3		0.018	0.009	0.014	0.014
(gr/acf)		(0.008)	(0.004)	(0.006)	(0.006)
kg/hr		0.3311	0.1723	0.2177	0.2404
(lb/hr)		(0.73)	(0.38)	(0.48)	(0.53)

Table C-228. PARTICULATE SIZE DISTRIBUTION; FACILITY P-2 ROLLER MILL INLET

Run number	
Date	12/06/78
Test time (min)	3
Water vapor %	8
Stack temperature °C	57
(°F)	(135)
Volume of sample, cf	2.796

Plate no.	Effective Aerodynamic Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	≥10.3	17.0	13.2
2	6.7	27.4	21.3
3	4.4	37.1	28.8
4	2.9	23.0	17.9
5	1.8	16.8	13.0
6	1.0	7.1	5.5
7	0.6	0.4	0.3
7	0.4	0.0	0.0
Filter		0	0
Total Weight (mg)		128.8	

Table C-229. SUMMARY OF VISIBLE EMISSIONS: BAGHOUSE P-2 ROLLER MILL, BAGHOUSE OUTLET (6 Minute Average)

Tyep of discharge	stack
Height of discharge point	100 ft
Description of background	sky
Description of sky	clear
Distance from observer to point	25 ft
Height of observation point	100 ft
Color of plume	white
Date	12/05/78

Set no	Run 1 test time (1357-1605) Average opacity	Run 2 test time (1050-1251) Average opacity
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0 (5 mins)
21	0	
22	0 (2 mins)	

Table C-230. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE Q-1 RAYMOND MILL, BAGHOUSE INLET

Run number		1
Date		6/15/78
Test time - minutes		120
Stack Effluent		
Flow rate	m^3/min (acfm)	72.5 (2560)
Flow rate	DNm^3/min (dscfm)	61.5 (2170)
Temperature	°C (°F)	67 (153)
Water vapor	Vol%	1.8
Particulate Emissions		
Probe and Filter Catch		
g/DNm^3 (gr/dscf)		11.99 (5.24)
g/m^3 (gr/acf)		10.16 (4.44)
kg/hr (lb/hr)		44.2 (97.4)

Table C-231. PARTICULATE SIZE DISTRIBUTION; BAGHOUSE Q-1 RAYMOND MILL BAGHOUSE INLET

Date	6/15/78
Test time (min)	0.50
Water vapor %	1.8
Stack temperature ^{o}C	67
(^{o}F)	153
Sampling rate (dscfm)	0.69

Plate no.	Effective Aerodynamic Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>12.1	22.6	44.4
2	7.69	13.6	26.7
3	5.09	13.0	25.5
4	3.6	0.0	0.0
5	2.3	0.3	0.6
6	1.2	0.5	1.0
7	0.7	0.6	1.2
8	.47	0.0	0.0
Filter		0.3	0.6
Total weight (mg)		50.9	

Table C-232. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE Q-1
#2 RAYMOND MILL, BAGHOUSE OUTLET

Run number		1	2	3	Average
Date		6/14/78	6/15/78	6/15/78	
Test time - minutes		120	120	120	120
Stack Effluent					
Flow rate	m^3/min	73.1	69.6	69.4	70.2
	(acfm)	(2580)	(2460)	(2450)	(2497)
Flow rate	DNm^3/min	59.5	59.2	59.5	59.4
	(dscfm)	(2100)	(2090)	(2100)	(2097)
Temperature	°C	83.8	65.5	65.6	71.6
	(°F)	183	151	150	161
Water vapor	Vol%	1.1	1.7	1.6	1.5
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.005	0.005	0.002	0.005
(gr/dscf)		(0.002)	(0.002)	(0.001)	(0.002)
g/m^3		0.005	0.005	0.002	0.005
(gr/acf)		(0.002)	(0.002)	(0.001)	(0.002)
kg/hr		0.0136	0.0181	0.0090	0.0136
(lb/hr)		(0.03)	(0.04)	(0.02)	(0.03)

Table C-233. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE Q-1 RAYMOND MILL, BAGHOUSE OUTLET (6 Minute Average)

Type of discharge	stack
Description of background	sky
Description of sky	cloudy
Distance from observer to point	90 ft
Height of observation point	35 ft
Color of plume	None
Date	6/14-15/78

	Run 1 test time (1538-1809)	Run 2 test time (0913-1127)	Run 3 test time (1332-1606)
Set no	Average opacity	Average opacity	Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	0
17	0	0	0
18	0	0	0
19	0	0	0
20	0	0	0
21	0	0	
22	0	0	
23	0	0	
24	0		
25	0		
26	0 (1 min)		

Table C-234. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE Q-2 #2 FLUID ENERGY MILL, BAGHOUSE INLET

Run number		1
Date		6/15/78
Test time - minutes		126.0
Stack Effluent		
Flow rate	m^3/min	58.3
	(acfm)	(2060)
Flow rate	DNm^3/min	49.3
	(dscfm)	(1740)
Temperature	°C	49
	(°F)	(121)
Water vapor	Vol%	4.7
Particulate Emissions		
Probe and Filter Catch		
g/DNm^3		2.38
(gr/dscf)		(1.04)
g/m^3		2.02
(gr/acf)		(0.88)
kg/hr		7.1
(lb/hr)		(15.6)

Table C-235. PARTICULATE SIZE DISTRIBUTION; BAGHOUSE Q-2 #2 FLUID ENERGY MILL BAGHOUSE INLET

Date	6/15/78
Test time (min)	1.5
Water vapor %	4.7
Stack temperature °C	49
(°F)	121
Sampling rate (dscfm)	0.64

Plate no.	Effective Aerodynamic Diameter (micrometers)	Weight (milligrams)	Percent per plate
1	>11.0	1.0	3.6
2	7.7	1.2	4.3
3	5.1	1.4	5.1
4	3.6	3.5	12.6
5	2.3	9.1	32.9
6	1.2	6.0	21.7
7	.70	3.1	11.2
8	.467	1.6	5.7
Filter		0.8	2.9
Total weight (mg)		27.7	

Table C-236. SUMMARY OF EMISSION TEST RESULTS; BAGHOUSE Q-2
#2 FLUID ENERGY MILL, BAGHOUSE OUTLET

Run number		1	2	3	Average
Date		6/14/78	6/15/78	6/15/78	
Test time - minutes		120	120	120	120
Stack Effluent					
Flow rate	m^3/min	52.1	42.2	44.2	46.2
	(acfm)	(1840)	(1490)	(1560)	(1630)
Flow rate	DNm^3/min	45.8	36.8	38.5	40.4
	(dscfm)	(1620)	(1300)	(1360)	(1427)
Temperature	°C	51.1	49.4	51.1	50.5
	(°F)	124	121	124	123
Water vapor	Vol%	2.8	4.1	4.2	3.7
Particulate Emissions					
Probe and Filter Catch					
g/DNm^3		0.002	0.002	0.016	0.007
(gr/dscf)		(0.001)	(0.001)	(0.007)	(0.003)
g/m^3		0.002	0.002	0.014	0.007
(gr/acf)		(0.001)	(0.001)	(0.006)	(0.003)
kg/hr		0.0045	0.0090	0.0408	0.0181
(lb/hr)		(0.01)	(0.02)	(0.09)	(0.04)

Table C-237. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE Q-2 FLUID ENERGY MILL, BAGHOUSE OUTLET (6 Minute Average)

Type of discharge	stack
Description of background	sky
Description of sky	partly cloudy
Distance from observer to point	90 ft
Height of observation point	85 ft
Date	6/14-15/78

Set no	Run 1 test time (1528-1558) Average opacity	Run 2 test time (0850-1058) Average opacity	Run 3 test time (1359-1618) Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6		0	0
7		0	0
8		0	0
9		0	0
10		0	0
11		0	0
12		0	0
13		0	0
14		0	0
15		0	0
16		0	0
17		0	0
18		0	0
19		0	0
20		0	0
21		0	0
22		0 (2 mins)	0
23			0
24			0 (1 min)

Table C-238. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE R-1 HAMMER MILL (6 Minute Average)

Type of discharge	fugitive
Height of discharge point	N/A
Description of background	inside plant
Description of sky	N/A
Distance from observer to point	25 ft
Height of observation point	ground level
Color of plume	white
Date	10/27-28/76

	Run 1 test time (0953-1110)	Run 2 test time (1307-1548)	Run 3 test time (0825-1108)
Set no	Average opacity	Average opacity	Average opacity
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0 (5 mins)	0	0
14		0	0
15		0	0
16		0	0
17		0 (5 mins)	0
18			0
19			0 (2 mins)

Table C-239. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE S-1
BAGGING OPERATION
(6 Minute Average)

Type of discharge	fugitive
Height of discharge point	3 ft
Distance from observer to point	7 ft
Height of observation point	ground level
Date	9/30/76

	Run 1
Set no	Average opacity
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0

Table C-240. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE T-1 PEBBLE MILL, INLET TO BAGHOUSE (6 Minute Average)

Type of discharge	fugitive
Description of background	inside
Description of sky	N/A
Distance from observer to point	10 ft
Height of observation point	floor
Color of plume	white
Date	10/19/76

	Run 1 test time (0959-1129)
Set no	Average opacity
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	1
12	2
13	0
14	0
15	2

Table C-241. SUMMARY OF VISIBLE EMISSIONS; BAGHOUSE T-1 BAGGER, INLET TO BAGHOUSE
(6 Minute Average)

Type of discharge	fugitive
Description of background	inside
Description of sky	N/A
Distance from observer to point	10 ft
Height of observation point	floor
Color of plume	white
Date	10/19-21/76

	Run 3 test time (1007-1149)	Run 1 test time (1503-1555)	Run 2 test time (1015-1201)
Set no	Average opacity	Average opacity	Average opacity
1	0	0	2
2	0 (7 mins)	0	0 (2 mins)
3	1 (4 mins)	0	0
4	0	0	3
5	1	0	3
6	0 (5 mins)	0	2
7	0	0	1
8	0	8	9
9	2		
10	0 (9 mins)		
11	0 (3 mins)		

Table C-242. SUMMARY OF VISIBLE EMISSIONS: BAGHOUSE T-1 VERTICAL MILL, INLET TO BAGHOUSE (6 Minute Average)

Type of discharge	fugitive
Description of background	inside
Description of sky	N/A
Distance from observer to point	10 ft
Height of observation point	floor
Color of plume	white
Date	10/20-21/76

	Run 1 test time (1457-1600)	Run 2 test time (0741-0810)
Set no	Average opacity	Average opacity
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0 (5 mins)
6	0	
7	0	
8	0	
9	0	
10	0	
11	0 (3 mins)	

Table C-243. SUMMARY OF VISIBLE EMISSIONS: BAGHOUSE T-1 SECONDARY CRUSHER, INLET TO BAGHOUSE (6 Minute Average)

Type of discharge	fugitive
Description of background	inside
Description of sky	N/A
Distance from observer to point	5 ft
Height of observation point	floor
Color of plume	white
Date	10/20-21/76

Set no	Run 1 test time (0812-1006) Average opacity	Run 2 test time (0820-0850; 0851-0921) Average opacity
1	0	0
2	0	0
3	0	0
4	0	0
5	0	1
6	0	0
7	0	0
8	0 (3 mins)	0
9	0	0
10	0	0
11	0	
12	0	
13	0	
14	0 (3 mins)	
15	0	
16	0	

Table C-244. VENTURI SCRUBBER MODELLING DATA; BASED ON THE MOLYBDENUM DRYER SCRUBBER INLET, SCRUBBER B-3

Calculation of overall penetration using a given pressure drop for a venturi scrubber operating under given test conditions

Modelling data for:	15" venturi	30" venturi
Given:		
Temperature ($^\circ$C)	66	66
Empirical factor (usually 0.5)	0.5	0.5
Mass mean particle diameter (microns)	1.75	1.75
Geometric standard deviation	1.5	1.5
Initial particle diameter for integration (microns)	0.1	0.1
Final particle diameter for integration (microns)	1.0	1.0
Particle diameter increment for integration (microns)	0.1	0.1
Density of liquid (g/cm^3)	1.0	1.0
Liquid to gas flow rate ratio (m^3/m^3)	9.36×10^{-4}	1.0695×10^{-3}
Gas velocity in venturi throat (cm/sec)	7028	9300
Gas viscosity (poise)	1.8×10^{-4}	1.8×10^{-4}
Density of the particles (g/cm^3)	3.8	3.8

Penetration results:

Particle size integration invervals (microns)	*Weighted penetration 15" venturi	 30" venturi
0.1 - 1.0	0.0017510204	0.0002471797
1.0 - 5.0	0.0043085551	0.0005062783
5.0 - 10.0	0.0000092926	0.0000010697
10.0 - 20.0	0.0000000197	0.0000000023
Total penetration	0.0060688878	0.00075453
Percent efficiency = (1-penetration)x100	99.4%	99.92%

Particulate concentration at scrubber inlet, as tested.

	g/DNm^3	(gr/dscf)
run 1	0.485	(0.212)
run 2	0.384	(0.168)
run 3	0.670	(0.293)

---

* Weighted penetration is that portion of the total penetration attributable to a specific particle size interval based on the particle size distribution parameters given above. Total penetration = (1-efficiency).

Table C-245. VENTURI SCRUBBER MODELLING DATA; BASED ON THE TOTAL INLET DUCT, SCRUBBER C-4

Calculation of overall penetration using a given pressure drop for a venturi scrubber operating under given test conditions

Modelling data for:	15" venturi	30" venturi
Given:		
Temperature (°C)	57.6	57.6
Empirical factor (usually 0.5)	0.5	0.5
Mass mean particle diameter (microns)	6.0	6.0
Geometric standard deviation	4.6	4.6
Initial particle diameter for integration (microns)	0.1	0.1
Final particle diameter for integration (microns)	1.0	1.0
Particle diameter increment for integration (microns)	0.1	0.1
Density of liquid (g/cm^3)	1.0	1.0
Liquid to gas flow rate ratio (m^3/m^3)	9.36×10^{-4}	1.0695×10^{-3}
Gas velocity in venturi throat (cm/sec)	7028	9300
Gas viscosity (poise)	1.8×10^{-4}	1.8×10^{-4}
Density of the particles (g/cm^3)	3.8	3.8

Penetration results:

Particle size integration invervals (microns)	*Weighted penetration 15" venturi	*Weighted penetration 30" venturi
0.1 - 1.0	0.015990352	0.0064967814
1.0 - 5.0	0.0012780762	0.000149821
5.0 - 10.0	0.0003148684	0.0000363128
10.0 - 20.0	0.0002489702	0.0000288283
Total penetration	0.0178322667	0.0067117435
Percent efficiency = (1-penetration)x100	98.2%	99.33%

Particulate concentration at scrubber inlet, as tested.

	g/DNm^3	(gr/dscf)
run 1	2.290	(1.001)
run 2	3.043	(1.33)
run 3	0.817	(0.357)

---

* Weighted penetration is that portion of the total penetration attributable to a specific particle size interval based on the particle size distribution parameters given above. Total penetration = (1-efficiency).

Table C-246. VENTURI SCRUBBER MODELLING DATA; BASED ON THE TOTAL DRYER SCRUBBER INLET, SCRUBBER D-1

Calculation of overall penetration using a given pressure drop for a venturi scrubber operating under given test conditions

Modelling data for:	15" venturi	30" venturi
Given:		
Temperature (°C)	156	156
Empirical factor (usually 0.5)	0.5	0.5
Mass mean particle diameter (microns)	5.0	5.0
Geometric standard deviation	1.9	1.9
Initial particle diameter for integration (microns)	0.1	0.1
Final particle diameter for integration (microns)	1.0	1.0
Particle diameter increment for integration (microns)	0.1	0.1
Density of liquid (g/cm^3)	1.0	1.0
Liquid to gas flow rate ratio (m^3/m^3)	9.36×10^{-4}	1.0695×10^{-3}
Gas velocity in venturi throat (cm/sec)	7028	9300
Gas viscosity (poise)	1.8×10^{-4}	1.8×10^{-4}
Density of the particles (g/cm^3)	3.8	3.8

Penetration results:

Particle size integration invervals (microns)	*Weighted penetration 15" venturi	*Weighted penetration 30" venturi
0.1 - 1.0	0.0001311675	0.0000192393
1.0 - 5.0	0.0013734764	0.0001584718
5.0 - 10.0	0.0006377524	0.0000735353
10.0 - 20.0	0.0002066908	0.0000239249
Total penetration	0.0023490871	0.0002751713
Percent efficiency = (1-penetration)x100	99.77%	99.97%

Particulate concentration at scrubber inlet, as tested.

	g/DNm^3	(gr/dscf)
run 1	21.7	(9.5)
run 2	17.2	(7.5)
run 3	14.2	(6.2)
run 4	36.04	(15.75)

---

* Weighted penetration is that portion of the total penetration attributable to a specific particle size interval based on the particle size distribution parameters given above. Total penetration = (1-efficiency).

Table C-247. VENTURI SCRUBBER MODELING DATA BASED ON THE SECONDARY CRUSHER BAGHOUSE INLET, BAGHOUSE I-1

Calculation of overall penetration using a given pressure drop for a venturi scrubber operating under given test conditions

Modelling data for:	6" venturi	15" venturi	30" venturi
Given:			
Temperature (°C)	18.3	18.3	18.3
Empirical factor (usually 0.5)	0.5	0.5	0.5
Mass mean particle diameter (microns)	11.2	11.2	11.2
Geometric standard deviation	3.7	3.7	3.7
Initial particle diameter for integration (microns)	0.1	0.1	0.1
Final particle diameter for integration (microns)	1.0	1.0	1.0
Particle diameter increment for integration (microns)	0.1	0.1	0.1
Density of liquid (g/cm^3)	1.0	1.0	1.0
Liquid to gas flow rate ratio (m^3/m^3)	9.36×10^{-4}	9.36×10^{-4}	1.0695×10^{-3}
Gas velocity in venturi throat (cm/sec)	4445	7028	9300
Gas viscosity (poise)	1.8×10^{-4}	1.8×10^{-4}	1.8×10^{-4}
Density of the particles (g/cm^3)	2.5	2.5	2.5

Penetration results:

Particle size integration invervals (microns)	*Weighted penetration 6" venturi	15" venturi	30" venturi
0.1 - 1.0	0.0108262579	0.0044299742	0.0016772595
1.0 - 5.0	0.0039164015	0.0011009241	0.0001326129
5.0 - 10.0	0.0007929081	0.0003646701	0.0000419832
10.0 - 20.0	0.0006737884	0.0003381429	0.0000391184
Total penetration	0.016209356	0.0062337113	0.001890374
Percent efficiency = (1-penetration)x100	98.4%	99.38%	99.81%

Particulate concentration at baghouse inlet, as tested.

	g/DNm^3	(gr/dscf)
run 1	0.524	(0.229)
run 2	0.650	(0.284)
run 3	0.954	(0.417)

---

* Weighted penetration is that portion of the total penetration attributable to a specific particle size interval based on the particle size distribution parameters given above. Total penetration = (1-efficiency).

Table C-248. VENTURI SCRUBBER MODELLING DATA; BASED ON THE #2 ENERGY MILL BAGHOUSE INLET, BAGHOUSE Q-2

Calculation of overall penetration using a given pressure drop for a venturi operating under given test conditions

Modelling data for:	6" venturi	15" venturi	30" venturi
Given:			
Temperature (°C)	51.1	51.1	51.1
Empirical factor (usually 0.5)	0.5	0.5	0.5
Mass mean particle diameter (microns)	1.5	1.5	1.5
Geometric standard deviation	2.3	2.3	2.3
Initial particle diameter for integration (microns)	0.1	0.1	0.1
Final particle diameter for integration (microns)	1.0	1.0	1.0
Particle diameter increment for integration (microns)	0.1	0.1	0.1
Density of liquid (gm/cm^3)	1.0	1.0	1.0
Liquid to gas flow rate ratio (m^3/m^3)	9.36×10^{-4}	9.36×10^{-4}	1.0695×10^{-3}
Gas velocity in venturi throat (cm/sec)	4445	7030	9300
Gas viscosity (poise)	1.8×10^{-4}	1.8×10^{-4}	1.8×10^{-4}
Density of the particles (gm/cm^3)	2.1	2.1	2.1

Penetration results:

Particle size integration intervals (microns)	*Weighted penetration 6" venturi	15" venturi	30" venturi
0.1 - 1.0	0.1244299172	0.0528489857	0.0201920044
1.0 - 5.0	0.0214611842	0.0052475505	0.0006637656
5.0 - 10.0	0.0002815686	0.0001243509	0.0000142996
10.0 - 20.0	0.0000370809	0.0000182875	0.0000021084
Total penetration	0.1462097009	0.0582391246	0.0208721781
Percent efficiency = (1-penetration)x100	85.4%	94.2%	97.9%

Particulate concentration at baghouse inlet, as tested.

	g/DNm^3	(gr/dscf)
run 1	2.38	(1.04)

---

* Weighted penetration is that portion of the total penetration attributable to a specific particle size interval based on the particle size distribution parameters given above. Total penetration = (1-efficiency).

APPENDIX D

D.1 EMISSION MEASUREMENT METHODS

During the standard support study for the metallic minerals industry, EPA conducted particulate emission tests at eight facilities; three were controlled with baghouses and three with scrubbers, and two with a combination of both. A data base of iron ore beneficiation and non-metallic minerals were also taken into consideration for this study. There were three test runs before and after each control system. The tests were run in accordance with EPA Method 5 (40 CFR Part 60 - Appendix A). Method 5 provides detailed procedures and equipment criteria, and other considerations necessary to obtain accurate and representative particulate emission data. Visible emission data were taken during the EPA tests in accordance with Method 9 (40 CFR Part 60 - Appendix A).

Of the eight facilities tested, minor modifications were required at seven sites. Three facilities using the scrubber control system had cyclonic flows at the outlet test points. Testing procedures at these locations were altered to adhere to Method 1-2.4 (40 CFR Part 60 - Appendix A). Even with this method the flow balance between inlet and outlet test points dictated EPA's decision to recalculate these data using only inlet flows. Two facilities contained high moisture in the ore being processed which resulted in plugged probe nozzles during the sampling. Normal testing times were shortened to obtain a sample in order to successfully complete testing program.

D.2 MONITORING SYSTEMS

The opacity monitoring systems that are adequate for other stationary sources, such as steam generators, covered by performance specifications contained in Appendix B of 40 CFR 60 Federal Register, October 6, 1975, are also technically feasible for the metallic mineral industry except where condensed moisture is present in the exhaust stream. When wet scrubbers are used for emission reductions from metallic mineral facilities, monitoring of opacity is not applicable; therefore, another parameter, such as pressure drop, would need to be monitored as an indicator of emission control.

Equipment and installation costs for visible emission monitoring are estimated to be about $18,000 to $20,000 per site. Annual operating costs which include the recording and reducing the data, are estimated at about $8,000 to $9,000 per site. Some savings in operating costs may be achieved if multiple systems are used at a given facility.

D.3 PERFORMANCE TEST METHODS

Consistent with the data upon which the new source standards have been established, the recommended performance test method for particulate matter is Method 5 (Appendix A, 40 CFR 60 - Federal Register, December 23, 1971, as amended August 18, 1977). In order to perform Method 5, Methods 1 through 5 must be used.

Subpart A of 40 CFR 60 requires that affected facilities which are subject to standards of performance for stationary sources must be constructed so the sampling ports adequate for the performance tests are provided. Platforms, access, and utilities necessary to perform testing at those ports must be provided.

Sampling costs for performing a test consisting of three Method 5 runs is estimated to range from $5,000 to $9,000. If in-plant personnel are used to conduct tests, the cost will be somewhat less.

The recommended performance test method for visible emission is Method 9 (Appendix A, 40 CFR 60, Federal Register, November 12, 1974).